JOURNAL
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[1]Chavance, J. Vet. Med. 41: (1946) 199-201

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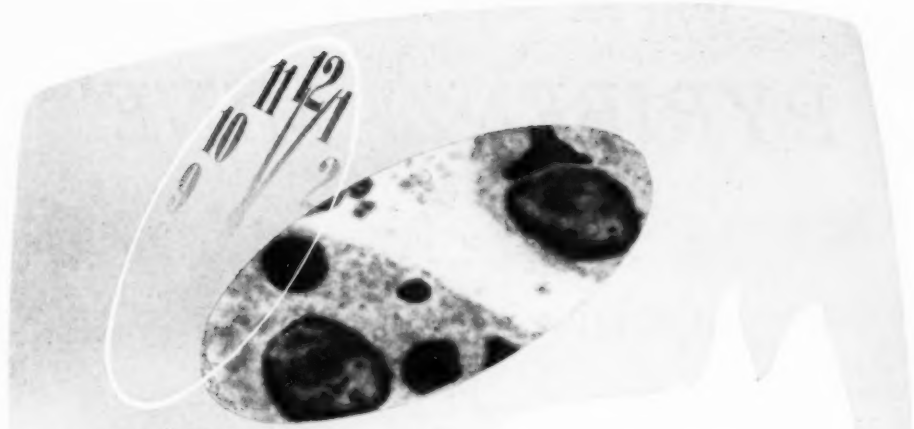

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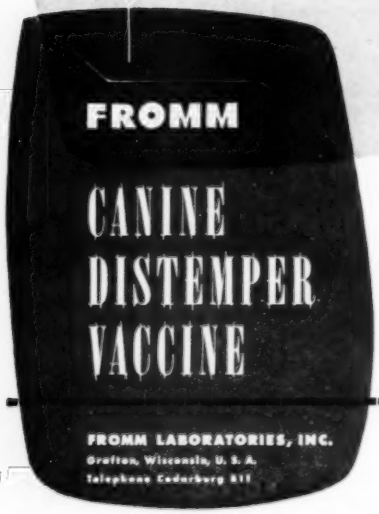

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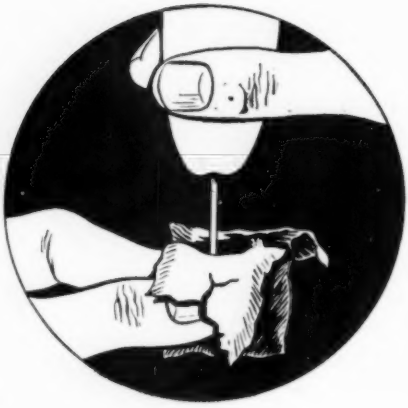

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AVMA ☆ *Report*

Veterinary Medical Activities

★ A record-breaking registration is expected at the 86th Annual Convention of the AVMA in Detroit, July 11-14, 1949.

• • •

★ "The Feed Industry As Seen Through the Eyes of Veterinarians" was the subject of a talk given by Dr. C. D. Van Houweling, AVMA director of professional relations, to the Agricultural Forum meeting of the Midwest Feed Manufacturer's Association in Kansas City, Mo., on February 18. A more complete report appears in the "News" section. While in Kansas City, Dr. Van Houweling also spoke to the Kansas City Veterinary Medical Association on "Agricultural Relations."

• • •

★ The Public Relations Committee of the AVMA, of which Dr. A. H. Quin is chairman, is gathering material preparatory to publishing a public relations guidebook for senior students. Plans are to have the booklet available before the close of the current school year.

• • •

★ Through the efforts of Dr. A. L. MacNabb, Executive Board member for District I, AVMA radio news releases—which are heard regularly by millions of farm listeners in the United States—will now be broadcast on farm programs throughout Canada over the network of the Canadian Broadcasting Corporation.

• • •

★ The televising of a "Fracture Panel" will be one of the features of the program of the 86th Annual AVMA convention in Detroit, July 11-14, 1949. The possibility of having other telecasts during the meetings is being explored. If it can be arranged, surgical demonstrations will be televised directly to the meeting rooms.

• • •

★ Dr. R. C. Klussendorf, assistant executive secretary, represented the AVMA at the organizational meeting of the National Advisory Committee for Brucellosis Eradication in Washington, D. C., on March 15. He also spoke to the student chapter of the AVMA at the University of Pennsylvania on March 16.

• • •

★ The outstanding humane work of AVMA Treasurer, Dr. W. A. Young, was highlighted in newspaper publicity given to the fiftieth anniversary celebration, on March 6, of The Anti-Cruelty Society of Chicago, of which Dr. Young is the managing director.

• • •

★ Dr. C. D. Van Houweling, director of professional relations, and Mr. J. J. Shaffer, of the public relations staff, both of the AVMA, have made a preliminary survey of the opportunities for veterinarians to participate in television programs. This information will be available, in mimeographed form, to members requesting it, from the AVMA office by April 15.

• • •

★ An "Institute on Public Health Practices for Veterinarians" held in Springfield, Ill., March 21-23, under the sponsorship of the Department of Public Health, featured outstanding speakers from the medical and veterinary medical professions as well as associated fields. One of the veterinarians appearing on the program was Dr. R. C. Klussendorf who gave "Concluding Remarks" and summarized the discussion.

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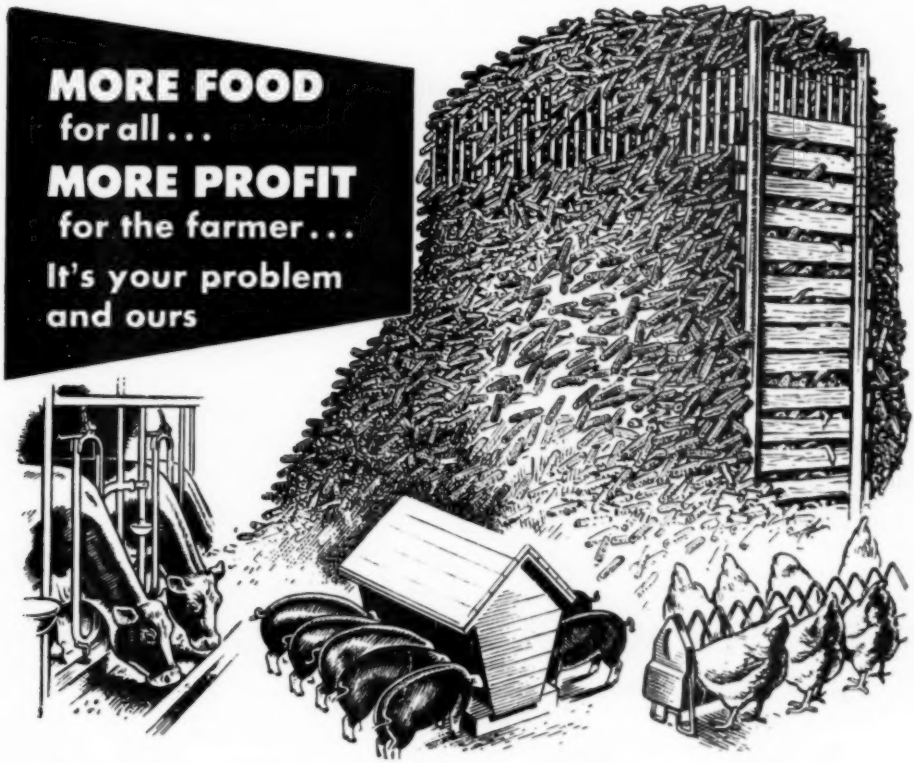

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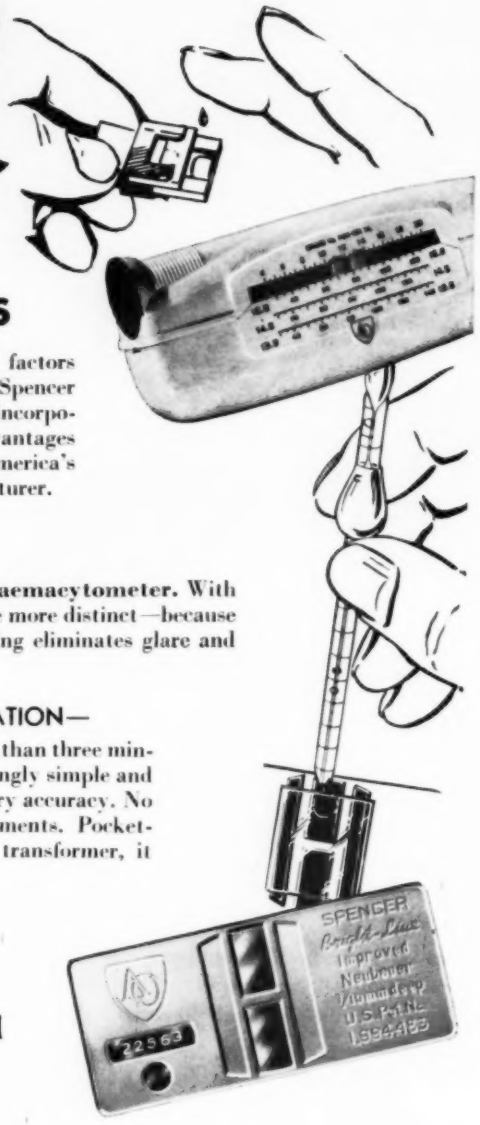

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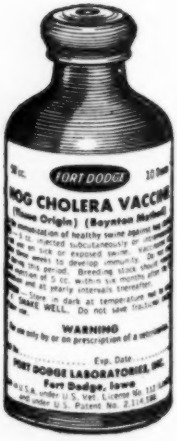

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Veterinary Ethics

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St. Louis, Missouri

ETHICS is defined as the science of morality. In relation to veterinary medical practice, it deals with the principles of correct professional conduct with regard to the rights of the veterinarian, his patients, and his fellow practitioners. The Code of Ethics is a set of rules established for the guidance of the veterinarian in his professional conduct.

A veterinarian's ethics should be held sacred and zealously guarded throughout his professional life; not to appease his colleagues, but to satisfy his own conscience. As outlined in the preamble, "The honor and dignity of our profession lies in our obedience to a just and reasonable code of ethics set forth as a guide to the members." The object of the Code, however, is more far-reaching, for exemplary professional conduct not only upholds honor and dignity, it also enlarges our sphere of usefulness, exalts our social standards, and promotes the science we cultivate. Briefly stated, it is the foundation of our individual and collective efforts. It is based upon the golden rule.

Every veterinarian should be thoroughly familiar with the American Veterinary Medical Association's Code of Ethics, and strive to live by the letter and spirit of it. The day is past when a member can plead ignorance of the Code; it is his duty to know its meaning, and, I think, a prerogative of the state and national associations to constantly strive to keep the profession enlightened on the subject, and the state and local associations to see that it is observed.

No student, today, should be allowed to graduate from an accredited school until he has been taught the meaning of professional ethics, and is thoroughly familiar with the AVMA Code of Ethics.

In 1945, the president of the American Veterinary Medical Association appointed a special committee on enforcement of the Code of Ethics. One of its first functions was to make a survey of the codes used by various state and local associations for comparison with the AVMA Code. About 50 per cent of the state associations that responded to the questionnaire used the Code of Ethics of the AVMA. The remaining state associations used codes which were adopted at times ranging from 1900 to as late as 1942. During the last fifty years, very little effort apparently has been made by state organizations to improve the ethical standards of advertising for veterinarians, if the codes can be taken as a criterion. It would seem that the adoption of the AVMA Code, or a similar one, by the various states would be a step in the right direction and would unify the veterinary profession. The second effort of the committee was to request all state and local associations to appoint an active committee on ethics in order to coördinate the functions of the state and local committees with that of the AVMA Committee on Ethics

It is the duty of every member of the profession to report violations to his state or local association which, in turn, should investigate such violations and attempt to correct them. In case of repeated and flagrant violations by members, the local committee should secure documented evidence for presentation to the Executive Board of the AVMA for action. However, inasmuch as every community has its own problems, each state and local association should make every effort to curb violations within its boundaries. There should be some active members in every association who are

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willing to devote time and energy to these problems. I believe that most state laws delegate to the veterinary examining boards rather broad powers to cope with unethical practices within the states. Such powers can and should be used to correct these unethical practices, if possible, but to revoke the license of persistent and chronic offenders if necessary.

ADVERTISING

Unethical advertising is perhaps the greatest source of violation of the Code of Ethics and is probably due, in part, to ignorance of the Code on the one hand, and to a competitive desire to out-advertise a colleague on the other. While conditions have improved somewhat in the past decade in many parts of the country, there is still far too much display advertising used by members throughout the land.

While I have not had an opportunity to make a survey of the telephone directories of many cities in the various states, I did, recently, observe the situation in one large city of this state. It is not my purpose to single out this city, for no doubt the situation is similar in other metropolitan areas. However, an examination of the telephone directory of this area revealed 42 major violations, 55 minor violations, and only 26 ethical listings.

Large display advertising, calling attention to special services such as boarding, bathing, clipping, free information, 24-hour service, specialist in skin diseases, the best is none too good for your pet, etc., are all unethical advertising and, not only in bad taste but, I think, a disgrace to the profession. This kind of advertising, mingled as it is with commodity advertising, degrades us as a professional group. We must keep our own faces clean if we are to expect the public to judge us as professional men.

Large signs with various colors, blinking lights, and animals in motion to attract attention to veterinary hospitals and offices are unprofessional to say the least, and should have gone out with the horse and buggy.

Advertisements in newspapers should be discontinued, but a professional card listing the veterinarian's name and degree, telephone number, and office hours is in good taste and serves a useful purpose, particularly in rural areas.

Other objectionable practices are radio advertising and payment of a fee or "cut-back" to persons calling them to certain large farms, kennels, racing stables, etc.

Testimonials by veterinarians, lending their names for the promotion of sales, is a vicious practice that should be discontinued by professional men. This practice is even more obnoxious when the veterinarian's photograph, or a picture of his hospital, is used in advertising.

Reports have been received, and criticism directed at the practice employed by some veterinarians in advertising as a specialist in canine practice or in other fields. While professing to be a specialist in any particular type of practice seems objectionable for a professional man, it would seem that some approved form of classified listings, which would be properly informative, is constructive and ethical and is quite frequently used by the medical and dental professions. It is common practice in many cities for the classified directory to indicate the type of practice in which a physician engages; for example, practice limited to the eye, practice limited to infants and children, or, in the case of a dentist, practice limited to prosthodontia, or oral surgery and exodontia. A similar listing for veterinarians whose practice is confined to specific fields, such as practice limited to small animals, or large animal practice only, are not only ethical and desirable in certain instances but are informative for the client seeking such services. For example, I am called many times to treat a sick horse or cow, and it is necessary to advise the caller that my practice is limited to small animals. Invariably, the next question is, "Where can I get a veterinarian to treat my sick cow?" I believe that ethical and informative listings would not only eliminate these unpleasant experiences, but would save time, and would be less confusing to the public.

OTHER VIOLATIONS

Not all violations of the Code of Ethics are confined to advertising. There are many violations of general and professional deportment in the field of practice, as well as in some of our universities, extension services, and pharmaceutical and supply companies.

The use of fictitious letters and names, such as "AAA Animal Hospital," which have little significance except to give an advantage in telephone listings over one's colleagues, should be frowned upon by the profession.

The matter of ethical consultations should be given some thought, and, no doubt, should be practiced more frequently among veterinarians. A clear knowledge of the true meaning of ethical consultation, and its more frequent practice, would not only be beneficial to us but would elevate the standards of veterinary medicine in the eyes of the public.

In my early days of practice, I had occasion to call into consultation seven different veterinarians at various times, and I can truthfully say that six of the seven showed complete lack of knowledge of the meaning of consultation. These violations were so flagrant as to be recognized by the owners in some cases. I have also had occasion to ask questions on consultation at veterinary state board examinations and was surprised to learn that most applicants had little knowledge of the true meaning of the term.

Perhaps some consideration should be given by the profession to the frequent critical situation existing between the young veterinarian and the older practitioner. It is quite understandable that, in many communities, the older man will resent bitterly the entrance into his community of a new veterinarian. However, we should strive for more tolerance from the older practitioner toward the younger man, and, at the same time, the conduct of the young veterinarian should be professional and gentlemanly. A committee from the local or state associations could act as an advisory board or board of censors to aid in developing amicable relations between the older and younger men.

While the relationship of the veterinary departments of colleges and universities has improved in the past few years, there are still friction and differences of opinions. It is surely necessary and desirable to teach certain veterinary subjects to agricultural students and others, but it is felt by some that the bounds of propriety have been exceeded in many instances. I am not sufficiently learned to express an opinion, but surely, since these are veterinary subjects, taught by veterinarians, it would seem possible for our profession to institute standards and formulate programs that would be mutually beneficial to both agriculture and the veterinary profession.

If it is necessary and desirable to require six years of schooling to adequately educate veterinarians in the diagnosis and treatment of animal diseases, it seems the height of folly to attempt to train county agents, druggists, farmers, and others to diagnose and treat diseases of livestock through the instrumentality of special or short courses in veterinary science.

There are instances of unethical procedures by veterinarians in the extension services and those employed by state and local governments. I do not think that these cases are widespread, and, for the most part, these men are making worthy contributions toward a closer coöperation between agriculture, the livestock industry, and the veterinary profession. However, there are cases where the extension veterinarian has been called in consultation, and without consulting the attending veterinarian, proceeded to make a diagnosis, give advice to the owner, and institute treatment. There can be little doubt that such a case is a breach of professional ethics.

There has been some controversy regarding the ethical procedure of veterinarians employed by some pharmaceutical and commercial companies. It would seem that a veterinarian should search his conscience and ponder the results of lending aid to those who, for financial reasons, would hamper the progress of veterinary science, and threaten the health and lives of our animal population through the incorrect diagnosis and treatment of diseases.

In conclusion, I do not believe that professional ethics has kept pace with the progress made in veterinary science; but, with the veterinary schools taking a more active interest in the teaching of ethics, and with the high caliber of students and the elevation of educational standards, veterinary science will take its place among the great professions of the world.

Foot-and-Mouth Disease Problems in Mexico

Facts gleaned from reports of Washington conferences and from announcements of the Joint Mexican-United States Commission on Foot-and-Mouth Disease reveal uneasiness among high officials regarding the duration of immunity afforded by vaccines now being produced in Mexico.

Although all concerned with the campaign are said to be gratified with the administrative and technical handling of the work and with the progress made in speeding up the local manufacture of vaccines, spokesmen for the eradication forces are giving a guarded prognosis of the results to be expected from the vaccination program.

"Recent information indicates greater safety against reinfection if revaccination is begun in about four months instead of the six-month interval formerly planned," Codirector Harry H. Johnson told an assembly of USDA officials and livestock industry representatives at a meeting in Washington, D. C., on February 17.

The apparently short immunity afforded by vaccines now available is being cited as an urgent reason for hastening the construction of a research laboratory under full United States jurisdiction, where developmental work would be done on vaccination and other phases of foot-and-mouth disease control.

Antibiotic Agents

A group of newer antibiotics has forged rapidly to the front, following closely on the heels of tyrothricin, penicillin, and streptomycin. The basic action of all of these antibiotic agents is one of strong bacteriostasis but only weak bactericidal effect. These substances vary greatly in origin and in chemical structure and, likewise, the mechanism of their action and the range of their activity vary widely. In general, they are now believed to attack an essential metabolic function of the invading organism as coenzymes.

Tyndal, in 1876, described the struggle between bacteria and molds and noted that sometimes one triumphed, sometimes the other. Pasteur, in 1877, noted an antagonistic action between *Bacillus anthracis* and other bacteria. The first antibiotic substance recognized was pyocyanase, by Emmerich and Low in 1899, who found it in cultures of *Pseudomonas aeruginosa*. The term antibiosis was suggested in 1928 by Papacostas and Gate and now is generally recognized to mean the production by one organism of specific chemical substances which have an injurious effect upon another organism. Dubos was the first to succeed (1939) in isolating an antibiotic substance in pure, crystalline form. This achievement of Dubos', although following by ten years the discovery of penicillin by Fleming, made possible the critical study of other antibiotic substances.

Tyrothricin, the first antibiotic commonly used in veterinary medicine, shows a marked degree of bactericidal activity *in vitro* against gram-negative and gram-positive organisms. It is moderately irritating to mammary tissue and injudicious use can cause severe injury. The principal use of tyrothricin is in the treatment of mastitis.

The sodium, calcium, and potassium salts of penicillin are the most commonly used forms. Penicillin has been found to be effective against a long list of organisms; however, the degree of effectiveness varies with the species of organism. Good results have been reported in the treatment of ornithosis and psittacosis. Organisms which are commonly encountered in veterinary medicine and which seem to be susceptible to penicillin are: *Bacillus anthracis*, Clostridium spp., staphylococci, streptococci, and some diphtheroid organisms.

Of the antibiotic substances that are active against gram-negative bacteria *in vitro* and *in vivo*, streptomycin occupies a prominent place. The toxicity is low. Experimentally, this antibiotic has demonstrated strong action against some gram-positive organisms as well. Streptomycin is bactericidal for a wide variety of bacteria *in vitro*. The streptococci and some strains of Corynebacterium are comparatively resistant to the action of streptomycin. Strains of organisms vary widely in their susceptibility to this antibiotic, but the susceptibility of species is not confined to the gram-negative bacteria. Streptomycin has been shown to be effective against coliform organisms, which occasionally cause mastitis, and some Pasteurella infections.

While the activity of penicillin and streptomycin supplement each other, there are still strains or organisms resistant to both. In 1945 Johnson, Anker, and Meleny observed that a strain of *Bacillus subtilis* was particularly antagonistic to other strains of a mixed culture in a badly infected compound fracture. From filtrates of this culture, a substance with high antibacterial activity and low toxicity was obtained. They called it bacitracin.

The antibiotic activity of bacitracin is, in general, similar to that of penicillin, but some penicillin-resistant organisms are bacitracin sensitive. *In vitro* tests reveal the drug strongly inhibitive for hemolytic streptococci, Pneumococcus spp., and Clostridium spp.

Bacitracin readily diffuses into the general circulation, but, it is more slowly excreted than penicillin. Blood levels persist for seven or eight hours following intramuscular injections. It is not effective when given orally, except for the treatment of local lesions of the gastrointestinal tract. Bacitracin is not destroyed by plasma, blood, pus, or necrotic tissue. Topical applications are ordinarily nonirritating and there has been little evidence of allergic reactions.

Clinically, bacitracin has been used topically and as local injections into abscesses or other infected localizations. It has been incorporated in ointments and aqueous solutions. The parenteral use of bacitracin has been largely experimental, so far, because used in this way is causes albuminuria.

An antibiotic substance from *Bacillus polymyxa*, which was named polymyxen, was discovered independently by several workers during 1947. This antibiotic was shown to be effective only against gram-negative organisms *in vitro* and to possess a high degree of therapeutic activity against some experimental infections in mice. Not long after these reports ap-

TABLE I—Antibiotic Agents

Antibiotic agent	Source	Date isolated	Toxicity	Diseases favorably affected *in vivo*
Mycophenolic acid	*Penicillium brevicompactum*	1896	Low	...
Pyocyanase	*Pseudomonas aeruginosa*	1901	Varies with preparation	Experimental anthrax
Penicillic acid	*Penicillium cyclopium*	1913	Low	...
Pyocyanin	*Pseudomonas aeruginosa*	1924	High	...
Violacein	*Chromobacter violaceum*	1926	...	...
Penicillin	*Penicillium notatum*	1929	Nontoxic by all routes	*Bacillus anthracis*, Clostridium spp., staphylococci streptococci, some diphtheroids
Citrinin	*Penicillium citrinum*	1931	Low	...
Puberulic acid	*Penicillium aurantiovirens*	1932	...	...
Gliotoxin	*Glíocladium fimbriatum*	1936	High	...
Iodinin	*Chromobacter iodinum*	1938	...	...
Fumigatin	*Aspergillus fumigatus*	1938	Low—prolonged parenteral use dangerous	...
Tyrothricin	*Bacillus brevis*	1939	Nontoxic—topical Hemolytic—parenteral Suitable—intrapleural use	Bovine mastitis
Aspergillic acid	*Aspergillus flavus*	1940	Neurotoxic for mice	Gas gangrene in guinea pigs
Actinomycin	*Actinomyces antibioticus*	1940	High	...
Gramicidin	*Bacillus brevis*	1941	Nontoxic—topical Toxic—parenteral	Bovine mastitis
Tyrocidine	*Bacillus brevis*	1941	Hemolytic protoplasmic Poison—nontoxic topical	Bovine mastitis
Streptothricin	*Streptococcus lavendulae*	1942	Low—oral & topical High—intravenously	Infected wounds and ulcers
Proactinomycin	*Proactinomyces gardineri*	1942	High	...
Penicillin B	*Penicillium notatum & chrysogenum*	1942	Low	*Br. abortus* in guinea pigs
Penicidin	Penicillium sp.	1942	...	...
Penatin	*Penicillium notatum*	1942	Low	*Br. abortus* in guinea pigs
Patulin	*Penicillium patulum*	1942	...	...
Parasiticin	*Aspergillus parasiticus*	1942	...	...
Notatin	*Penicillium notatum*	1942	Low	*Br. abortus* in guinea pigs
Gigantic acid	*Aspergillus giganteus*	1942	...	...
Fumigacin	*Aspergillus fumigatus*	1942	...	...
Claviformin	*Penicillium claviforme*	1942	Moderate—oral & topical	...
Clavacin	*Aspergillus clavatus*	1942	Moderate—oral & topical	...
Chaetomin	*Chaetomium cochliodes*	1943	...	...
Flavacidin	*Aspergillus flavus*	1943	Relatively nontoxic	...
Flavicin	*Aspergillus flavus*	1943	Slightly—pure forms	...
Gladiolic acid	*Penicillium gladioli*	1943	...	...
Helvolic acid	*Aspergillus fumigatus*	1943	...	...
Allicin	*Allium sativum* (garlic)	1944	...	...
Aspergillin	*Aspergillus fumigatus*	1944	Low—experimental animals	...
Chlorellin	*Chlorella vulgaris*	1944	...	...
Crepin	*Crepis taraxicifolia*	1944	...	...
Gramicidin S (Soviet strain)	*Bacillus brevis* strain	1944	Moderate—parenterally Nontoxic—topical	Bovine mastitis
Subtilin (bacitracin)	*Bacillus subtilis*	1944	Low	...
Viridin	*Trichoderma viride*	1944	...	...
Streptomycin	*Streptococcus griseus*	1944	Low—prolonged administration may damage 8th nerve	Coliform mastitis, Proteus of canine dysentery, Salmonella, and Pasteurella
Ustin	*Aspergillus ustus*	1945	...	...
Bacitracin	*Bacillus subtilis*	1945	Low—topically Higher other routes	Staphylococcic abscesses Fungus infections
Actidione	*Streptococcus griseus*	1946	...	...
Eumycin	*Bacillus subtilis*	1946	...	...
Expansine	*Penicillium expansum*	1946	...	...
Glutinosin	*Metarrhizium glutinosum*	1946	...	...
Grisein	*Streptococcus griseus*	1946	...	...
Javanicin	*Fusarium javanicum*	1946	...	...
Litmocidin	*Proactinomyces cyaneus*	1946	...	...
Protoanemonin	*Anemone pulsatilla*	1946	...	...
Tomatin	*Lycopersicon esculentum*	1946	...	...
Actinorubin	Streptococcus species	1947	...	...
Chloromycetin	*Streptococcus lavendulae*	1947	...	Rickettsiae and viruses
Lavendulin	*Streptococcus lavendulae*	1947	...	...
Polymyxin	*Bacillus polymyxa*	1947	Greater than penicillin or streptomycin	Pasteurellosis and pneumonia
Aerosporin	*Bacillus aerosporous* (Greer)	1947	Greater than penicillin or streptomycin	...
Aureomycin	*Streptococcus aureofaciens*	1947	Apparently low	Undulant fever

peared, other workers announced that they had isolated an antibiotic, active against gram-negative organisms, from *Bacillus aerosporous* Greer. They named this agent aerosporin.

Although polymyxen and aerosporin are derived from similar microörganisms, recent comparisons of the two products suggest that they are dissimilar in chemical composition. The bacterial activity of these antibiotics is practically identical, and they can be considered the same in so far as practical usage is concerned.

Polymyxen, *in vitro*, is most effective in an acid medium, is relatively heat stable, and retains its activity in the presence of serum. In its effective concentrations, it appears to be bactericidal in its action on susceptible organisms. Its toxicity in experimental animals is considerably greater than that of penicillin or streptomycin.

Chloromycetin, described by Erlich and his associates, was the first shown to be effective against rickettsial agents and several viruses. The drug is rapidly absorbed when given orally. Because of its irritant properties and insolubility in water, it apparently will not find wide usage parenterally. In dogs, repeated parenteral injections cause anemia, but it has not been noted from oral administration. In man, it has been proved very effective against scrub typhus (*Rickettsiae tsutsugamushi*).

The latest antibiotic to receive particular notice is aureomycin. It is derived from a strain of *Streptomyces aureofaciens*. It is soluble in distilled water but somewhat less soluble in isotonic sodium chloride solutions. The activity deteriorates rapidly in alkaline solution at room temperature.

Aureomycin has been shown to possess antibacterial activity against numerous gram-positive and gram-negative organisms, particularly *Brucella melitensis*. Repeated large doses were tolerated in rats and dogs, with moderate local reaction and some loss of weight. High concentrations were noted in the urine.

In man, it has been noted that aureomycin was sufficiently effective in combating lymphogranuloma venereum to warrant further extensive research and clinical trial. As a treatment for undulant fever (*Brucella melitensis*), it has been reported to be superior to any tried before.

It was John Adams, second president of the United States, who is credited with having established what is now the U.S. Public Health Service.

Mastitis cases secreting a serous or watery fluid, instead of milk, are difficult to treat and offer a poor prognosis.

Soviet Textbooks Must Conform to New Doctrine

This article, published in an official journal of the Soviet Ministry of Agriculture, apparently carries the weight of a directive. In order to conform to the Michurin-Lysenko doctrine of the supremacy of the environment and the inheritance of acquired characteristics, the veterinary educational program and veterinary textbooks must be purged of "errors" as soon as possible. The author quotes passages which should be expunged or corrected in the light of Lysenko's revelations. Some of these are references to obsolete or disputed theories which would probably be justifiable deletions. The fact that they are seriously considered today is evidence of scientific isolation. The majority, however, are concepts of such fundamental importance that their discard must certainly have a material effect upon Soviet agriculture.

For example, a histology text must not contain the statement that each chromosome of the given number possesses its own characteristics and retains those characteristics in the following generations of cells.

A pathologist is taken to task for suggesting that the breeding of domestic animals could be regulated according to Mendelian laws to prevent the transmission of pathologic predispositions. Reference to Morgan's work with lethal genes is also condemned, as is a statement that the existence of genes is substantiated by a whole series of facts.

It is now heresy to say, ". . . thus the superiorty of the highly cultivated breeds consists of the presence of valuable genes and their successful and stable combination, which is expressed in the exceptional productivity of the given breed."

The dialectic behind Michurinism seems to be as follows: If there were anything inherent in the organism which predetermined its development, man would have to "await favors from Nature" instead of changing Nature to suit his purposes; ergo, genes do not exist. Q.E.D. This from a school which scorns Aschoff's teleological views of inflammation!—[*V. M. Koropov: Against Reactionary Theories in Veterinary Medicine. Veterinariya, 25, (Dec., 1948): 7-11.*]—R. E. Habel.

The use of the stomach tube and of intravenous medication provides the backbone of a successful swine practice.—*T. L. Steenerson, Indiana.*

SURGERY & OBSTETRICS
AND PROBLEMS OF BREEDING

Endocrinology and Its Relation to Reproduction

GEORGE H. HART, V.M.D.
Davis, California

CORRELATION of scientific discoveries with other old and new factual information is often necessary before they obtain general application in clinical medicine. This has a bearing on the long-standing points of disagreement between the pure scientist and the clinician. Endocrinology has furnished its share of difficulties in this respect. In the evolutionary sense, the endocrine method of stimulating cell activity antedates the nervous system in the development of life. Both are involved in carrying out the multiplicity of physiologic activities in all of the higher vertebrates.

The endocrines are defined as products of glandular cells produced in one part of the body, absorbed directly into the blood stream, and thereby carried to other tissues which they stimulate or inhibit in certain specific cellular activities. They produce their physiologic effects alone, with other hormones, or in conjunction with nervous mechanisms, thereby regulating enzyme action. All these are modified by environment and heredity which makes the full understanding of the end results involved and difficult to fully interpret.

Olmsted,[1] in his life of Claude Bernard (1813-1878), gives this eminent French physiologist credit for initiating the study of endocrinology. In the course of Bernard's liver studies culminating in the isolation of glycogen, he hit upon the idea of internal secretion in the problem of following sugar entering and leaving the liver. Although today we do not consider sugar a hormone, Bernard's concept stands as an important epoch in the development of this biological science.

It remained for Bayliss and Starling[2] to be the actual discoverers of the first specific substance when they isolated "secretin" in the gastrointestinal tract and coined the word "hormone" for these chemical messengers.

Great strides in the understanding of metabolism and metabolites have been made in the twentieth century through the brilliant work in organic and biochemistry. We now better understand, for example, the chain of reactions that take place as glycogen stored in the liver is converted into glucose in passing into the blood stream to supply energy to the tissues until its end products, carbon dioxide and water, are eliminated from the body. Also of interest are the inborn errors of metabolism in different species covered by Garrod[3] who gives us islands of knowledge in the still great sea of the unknown. A striking example of this is the well-known alkaptonuria in some human beings and the Dalmatian dog. In this breed, complete metabolism of the amino acids, tyrosine and phenylalanine, does not take place and homogentisic acid appears in the urine, causing it to turn black on standing. This is, therefore, evidence that homogentisic acid is one of the stages in the complete metabolism of these amino acids in normal animals.

In the enormous number of chemical reactions taking place in the cells and fluids of the body, there are essentials and/or aids to the process. To these substances have been given names such as enzymes, catalysts, vitamins, hormones, and others, each of which at present has a more or less distinct meaning. Time may demonstrate that two or more of these substances may have reference to the same thing.

With these general statements, let us turn to the discussion of the endocrine glands and their hormones that are involved in reproduction.

NORMAL PHYSIOLOGIC STATE

While there are marked species differences, the normal control of the reproductive processes are similar in our larger domestic animals. The master gland in the process is the pituitary gland, generally termed the hypophysis, a small body at the base of the brain lying in the sella turcica of the sphenoid bone. The posterior lobe, of lesser importance, is developed from the

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brain and secretes two hormones, pitressin and pitocin which stimulate contraction of unstriped muscle, raise blood pressure, and are oxytocic. The anterior lobe, non-nervous tissue but originating from the buccal cavity, is of much greater importance and secretes a variety of hormones of which the growth, thyrotropic, lactogenic, adrenotropic, and gonadotropic are the most important. It is the latter with which this discussion is particularly concerned.

When growth processes are slowing up at rather definite periods in the lives of various species, the secretion of this hormone stimulates the development of the gonads in both sexes and brings on the manifestations of puberty. In the male domestic mammal, the gonad stimulation is less marked than in the female and sets up the activity of the interstitial cells of Leydig in the testes which secrete androgen, formerly known as the male sex hormone. This hormone causes the development of the male secondary sex characteristics and stimulates sexual libido. Gonadotrophins probably also stimulate spermatogenesis, but this cannot yet be definitely demonstrated experimentally. In birds, the male is sensitive to gonadotrophin stimulation, and spermatogenesis may be demonstrated with the ovary being refractory.

In the female mammal, this gonad stimulation starts cyclical follicular development of the primordial follicles in the ovary with maturation of definitive follicle or follicles, and single or multiple ovulation, depending on the species. In the liquor folliculi of the follicle, estrogen, formerly known as the female sex hormone, is developed. This produces the female secondary sex characteristics, marked activity of the uterine muscle fibers, and the manifestations of estrus. It has not been experimentally demonstrated to bring on ovulation and large doses inhibit ovulation. Both natural and synthetic estrogens have been widely used clinically for this purpose and some satisfactory results reported. This action is explained by its indirect effect through pituitary stimulation.

After rupture, the place of the ovum and follicular fluid is taken by the rapidly developed corpus luteum. This is also glandular tissue composed of the yellow pigmented lutein cells derived from the granulosa and theca cells lining the follicle. The pituitary gland secretes the hormone progesterone, which prepares the uterus to receive the fertilized ovum by stimulating progestational proliferation in the endometrium, inhibiting the action of estrogen and stopping follicular development.

To simplify this paper, only the four sex hormones, gonadotrophin, androgen, estrogen, and progesterone, will be discussed.

STRUCTURE DISTRIBUTION AND AVAILABILITY

One source of these hormones has been mentioned, but some or all of them are, or may be, produced in other tissues of the body or synthesized outside the body. The gonadotrophins are produced primarily in the hypophysis, but are also produced, or found, in the chorionic epithelium of pregnant women, the urine of women at menopause, and during pregnancy; in other primates; in the amniotic fluid, uterine cups, and the blood of pregnant mares at forty-five to 175 days of gestation; and in minute quantities in other species. All of these substances do not have identical chemical structure or physiologic action. Great effort has been made to demonstrate two functions or separate fractions in this hormone, one a follicle-stimulating hormone FSH, and the other a luteinizing hormone LH. These fractions have never been isolated separately from the blood or urine of any animal, thus leaving some doubt as to their existence as separate entities.

The gonadotrophins are proteins having a complicated molecular structure and do not offer much chance of being synthesized. Their protein-like nature involves them with sensitization, and repeated injections may result in anaphylactic manifestations, particularly where the unpurified product in the form of pregnant mare serum is administered repeatedly.

The remaining three hormones under discussion are all steroids and have been synthesized outside the body. Considerable confusion has resulted from the fact that androgens and estrogens are not sex specific, both being found in either sex. Just where large amounts of opposite sex hormones, estrogens in stallion urine, for example, are produced is not apparent now in all cases. The adrenal glands are involved, and feminizing effects on males and virilism in females in human beings have been definitely ascribed to tumors of the adrenal cortex.

Androgens are synthesized mainly for commercial use and are on the market as testosterone propionate, with a variety of trade names. This is the best source, although they are also present in the urine of males, ovaries of some species, and feces of others, including the cow. The yield of the product is small and therapeutic application is still expensive.

Estrogens are plentiful, being found, in addition to the liquor folliculi of all species, in the urine of pregnant mares in the last half of pregnancy as a result of excessive production in the placental tissue (Hart

and Cole[4]), in the urine of stallions, and even in some plants. The Dwalganup strain of subterranean clover is such a plant and male sheep, particularly wethers living exclusively on it in western Australia, develop female characteristics and ewes become infertile (Bennetts[5]).

Estrogens are readily synthesized—a widely used synthetic preparation is diethyl stilbestrol.

Progesterone made from corpus luteum tissue, or synthesized, is high in price for general therapeutic application. It has not been located definitely in any other tissue. The fact that pregnant females of some species abort following removal of the corpus luteum, while others can be subjected to this procedure at different stages of pregnancy without the uterus being emptied, suggests that it may be produced elsewhere, *i.e.*, placental or endometrial cells.

The last two hormones are involved in udder development, both during intrauterine and postuterine life. Estrogen promotes duct formation, and progesterone, lobule formation. The lactogenic hormone from the anterior hypophysis is the stimulant for actual milk secretion.

The Problem of Nomenclature

In this field, with its multiplicity of workers, new discoveries, and advances in organic chemistry, many names are necessary for the products actually known to exist.

The confusion in names to even the research worker becomes more confusing to the practitioner when each biological house gives its own trade name to each product it sells. This provides for as much as a dozen different scientific and trade names for products more or less alike and advertised for the same therapeutic administration.

Thus, highly potent products and those of doubtful value may be offered the busy and relatively uninformed practitioner, so that, unfortunately, salesmanship seems to dictate the product to be used.

Clinical Problems

This field has many interesting research problems of its own. At present, partial knowledge regarding the interaction of hormones, the multiplicity of products, antihormone effect, synergistic action, etc., have somewhat bogged down the scientific thinking, and carefully collected clinical data are greatly needed. In this way, the practitioner can build on the work of the research worker, and often mutual benefit will result.

The history of this side of the problem dates from the normal, male-comb growth produced in capons, in which successful testicular transplantation was accomplished by Berthold in 1849. Brown Sequard (1869), also called the father of endocrinology, used testicular extract on himself and reported rejuvenating effects. This was followed during this century by the work of Steinach in Germany and the great publicity program of Voronoff in France, which furnished the background material for the variety of goat-gland transplanting specialists in this country. Voronoff, amid great publicity in the popular press, went to Africa under commission of the government of Algeria, through claims to rejuvenate old male animals and to increase the body weight and wool clip of young rams by testis grafting. The retired French admiral of World War I, on whose farm in Algeria this work was done, visited at Davis, Calif., and gave details of the high point to which charlatanism actually progressed. A report[6] on these claims was made by four scientists from Great Britain who visited Algeria in 1927, in company with delegates from Argentina, France, Italy, Spain, and Czechoslovakia, to study the experimental animals. They concluded that the methods used excluded the possibility of forming a critical opinion, and that the direct economic advantages of the operation were negligible.

In 1925, C. M. Haring[7] toured Europe on sabbatical leave and spent several months at the University of Zurich. He observed that Swiss veterinarians in private practice were transplanting testicular tissue from young bulls being slaughtered at packing plants to breeding bulls on dairy farms. The tissues were carried in thermos containers to keep them cold and fresh.

At the time the Division of Veterinary Science (University of California, Davis) performed some experimental procedures, transplants of this kind were made subcutaneously or intramuscularly usually in the side of the neck. In all cases, the sperm-producing cells atrophied at once and completely disappeared. When a so-called "take" occurred the interstitial cells survived and produced male sex hormone which increased libido. Thus, occasionally, a bull with normal spermatogenesis, but little or no sexual libido, might be stimulated to breeding activity. Such transplant operations had a high percentage of failure, and the whole procedure was discarded.

Unfortunately, its place has been taken, to some extent, by a more subtle type of exploitation using inert or nonindicated preparations and poor selection of cases. With the recognized difficulties under the

most favorable conditions, there has resulted a general feeling of severe limitation to hormone therapy in veterinary practice, which also exists in medical practice.

In February, 1946, a conference on "The Problem of Fertility" was held in New York under the auspices of the National Committee on Maternal Health, and the contributions were published in book form by the Princeton University Press.

E. T. Engle in the preface makes the following statements:

> Research on various aspects of reproduction has ramified widely in the last two decades. Investigation using the smaller laboratory animals has been most fruitful in revealing the fundamental biological factors in the physiology of reproduction. In many respects, the successful application of these basic principles to clinical therapy leaves much to be desired. No area of this field has been more successfully developed and applied to practical purposes than that occupied by Animal Husbandry.
>
> The purpose of this Conference was to reveal the successes of investigations on the processes of reproduction in domestic animals. The results of these investigations are of utmost importance and practical value in themselves. They should also serve to reactivate investigations on the induction of ovulation in woman and to encourage further detailed investigations in the biology of human spermatozoa.

This optimistic statement regarding successes in animal husbandry has not been fully realized, but the collection of data by clinicians is urgently needed in order to know how to select cases and what to expect with the use of products of established potency.

Essentials are a breeding history of the animal, or preferably of the entire herd, a physical examination when possible, and a recognition of species variation in the physiology of reproduction and susceptibility to the action of hormones.

SPECIES VARIATION

Horses.—Gonadotrophins are indicated in mares, with normal genital tracts, that fail to settle. There may be some advantage in using a gonadotrophin of equine origin. Clinical observations on their use have been reported by Cameron,[8] Dimock,[9] and others. Timing of administration, dosage, and when to breed following injection are matters on which data are too limited. Overdosage will result in excessive ovarian enlargement and multiple ovulation in all species.

The margin between no response, a normal physiologic result, and excessive effect are relatively narrow in some physiologic states of patients—probably between 1,000 and 3,000 I.U. This brings out the importance of case histories and management practices. In Cameron's cases, some of which were bred the day following administration and pregnancy resulted, difficulties in parturition occurred, particularly retained placenta. He felt this resulted from failure of proper endometrial preparation for implantation and suggested breeding be delayed until the following natural heat period.

In stallions lacking libido, results have been varied. It is common for spermatogenesis to be normal in such cases. Treatment with gonadotrophins or androgens is definitely indicated in normal, properly fed and exercised animals in which lack of libido is the only evidence of abnormality. Positive effects should be noticed in one to two days and should continue for several weeks. Excessive use under severe stimulation should be avoided. Variations in results are still not readily explained. Kearns[10] has reported marked improvement in racetrack performance of geldings with testosterone pellets, but their use for this purpose is open to question.

Cattle.—Casida[11] has discussed the indications for the use of gonad-stimulating hormones in those conditions where infection is not the primary cause under five classes: (1) cows which do not come into heat; (2) cows which do not settle upon service; (3) nymphomania cows; (4) bulls which do not settle cows; and (5) bulls refusing, or slow in, service. Difficulty was found in bringing only a single follicle to maturity. In the Wisconsin Station herd, different cows that failed to come into heat were shown to have persistant corpus luteum, quiescent ovaries, periodic development of anovulatory follicles without heat, and periodic ovulation without heat. Cows in all of the conditions responded in some degree to gonadotropic extracts. Fewer rat units of pituitary extracts were needed to produce a response than when pregnant mare serum was used. His conclusion was that the control of ovulation by this treatment does not appear satisfactory.

In more recent work, Casida, McShan, and Meyer[12] used unfractionated extracts of sheep pituitary in doses of 0.67- to 2.5-Gm. equivalents, injected intravenously, in 96 cows with cystic ovaries. In 81 of the animals, nymphomania symptoms existed which were relieved in 72 cases by the single treatment. Corpora lutea were formed in 74 of the 96 animals within thirty-one days after treatment. In 84 animals showing no recognized pathology, 53 were bred after one treatment and 36 became pregnant. Thus, a positive action of the pituitary gonadotrophin upon cystic ovaries was demonstrated.

We have observed that in well-developed

heifers with quiescent ovaries, as manifested by palpation and/or close observation over twenty-one to thirty days with no estrus, gonadotrophins are indicated to start normal cycling with recommended breeding on the first or second heat period. This is successful in bringing on estrus, but breeding often results in a low percentage of pregnancies and the next estrus is variable, suggesting the pseudopregnancy phenomena shown in the white rat by Hart and Cole[13] and others. In studying relative efficiency of spayed, open, and bred heifers in the feedlot (Hart, Guilbert, and Cole[14]), 5 noncycling heifers of the 14 head for the pregnancy group in the 1939 trial were so treated with 1,000 I.U. of pregnant mare serum, subcutaneously. All 5 of them were in heat on September 17, two days after the injection, and all were bred that day. Only 1 became pregnant; the remaining 4 all became pregnant when bred on the following natural estrus, which recurred at intervals of twenty-six, forty-nine, fifty-six, and seventy-five days respectively. This observation and other scattered field-trial data of a similar nature suggest that a higher incidence of pregnancy might result if breeding were delayed until the second heat period following therapy, and the undesirable results of possible multiple ovulation avoided. Fincher[15] reports good results in cystic ovary cases with large doses of gonadotrophins (follutein, the gonadotrophin in human pregnancy urine), 10,000 I.U. in one group of 6 cases, and less satisfactory results in 25 other equally well-selected cases. Estrogens are known to stimulate greatly the uterine nonstriated muscle fibers. They are indicated in pyometra and mummified or dead fetuses which fail to be expelled even when the cervix is dilated. Fincher[15] reports success in 50 per cent of such cases, and the action of estrogens is aided by posterior pituitary extract given after twelve to twenty-four hours.

In bulls that are temporarily injured in service, the memory of the accident may overcome normal libido and they may fail to breed. Stimulation with gonadotrophins is indicated. A valuable Hereford sire, from the university herd, injured his penis in service and, although complete recovery occurred, he would make no effort to breed thereafter. One year after the injury, 1,500 I.U. of gonadotrophin in pregnant mare serum were injected. This stimulation overcame the inhibition, and in two days he bred a cow normally and has continued to do so for three years, being the main Hereford herd sire now at the University Farm. Fincher[15] has reported favorable temporary results in slow breeding bulls with large doses (10,000 I.U.) of gonadotrophins and testosterone (100 mg.) used separately in different cases, but our results with pregnant mare serum in such bulls have been disappointing.

In cystic ovary and retained corpus luteum, the conditions of management, degree of abnormality, and duration of the condition are involved. Today, with breed associations requiring reproduction with the most desirable type of O.A.R.T.* records and high meat value of dairy cows, we do not encounter the extreme cystic ovary conditions of long standing as in former years. At that time, many owners of purebred animals would not allow cystic ovaries in cows on test to be treated, because they had observed that it reduced milk flow. The manual treatment of cystic ovaries, in my experience, is helped if the cow can be dried up. Some experimental data and many field observations give evidence that these conditions are a defense mechanism when the drain of lactation and reproduction would be too severe under the environmental conditions to which the animal is subjected. An experimentally proved scientific explanation is not possible at present. There is evidence that drying up such animals after prolonged treatment, or no treatment, and turning them out to good pasture with a bull will result in a large percentage getting pregnant. Repeated therapy with estrogens has been reported to produce cystic ovaries. This needs confirmation. Moderate doses of gonadotrophins are indicated and are preferable to estrogens because of their greater stimulation to ovulation.

Manual extirpation of retained corpus luteum has been practiced for many years as a routine procedure and holds an important place. Rough handling through the vaginal wall in deep-seated cases is not to be taken too lightly. Serious hemorrhage may result and also a general, chronic, hyperplasia of the ovary. Mild massage and 1,000 to 3,000 I.U. of gonadotrophins are indicated. In this use of hormones, no miracles are to be expected. They are simply an aid in the return of normal physiologic processes when the environment makes this possible. A number of factors are involved in the proper selection of cases, requiring judgment on the part of the practitioner.

Sheep.—Rams turned in with ewes at the beginning of the breeding season will sometimes drift off by themselves and pay no attention to the ewes. This occurs particularly in yearling rams used for the first time in hot weather where early pregnancy

*Official Advanced Registry Test.

is desired for spring lamb production. Gonadotrophins are successful in stimulating the sex drive in such cases and, once started, breeding continues in a normal manner. Sterility in rams with normal libido is not uncommon, so that semen examination at the beginning of the breeding season is recommended.

Much greater in importance is the problem of getting anestrous ewes to come into estrus where early lambing is essential in the production of spring lambs. The animal husbandry group at Davis have carried out extensive studies of this problem both with nutrition (Hart and Miller,[16] Miller, Hart, and Cole[17]) and with hormones (Cole, Hart, and Miller[18]).

More than 300 ewes have been used in studies of induction of estrus in anestrous ewes. A single injection of equine gonadotrophin (PMS) in anestrous ewes may cause ovulation without estrous manifestation. The smallest effective dose is about 100 I.U. At levels of 600 to 750 I.U., autopsy reveals superovulation or many large follicles without rupture. Eight of 118 ewes given one injection came into heat within ten days, were bred, and none became pregnant; 58 of 170 given two injections seventeen days apart came into estrus, 53 were bred, and 17 became pregnant; 6 of 49 with three injections at seventeen-day intervals came into estrus, were bred, and 2 became pregnant.

While a full physiologic response is not obtained with a single injection, there was indication that this may hasten the onset of the sexual season.

Preliminary treatment with estrogen, 100 to 400 R.U., did not stimulate ovarian activity. This amount did not regularly induce estrus, and ovulation is inhibited with too large a dose of estrogen. The same results were obtained with the combined use of pregnant mare serum and estrogen.

Pregnant mare serum, 250 to 600 I.U., supplemented with 10 to 30 mg. of progesterone, had no observable effect on either ovulation or estrus and provided little evidence of synergistic action. Supplementing PMS with both estrogen and progesterone at different dose levels and spacing of injections produced little evidence of developing sexual receptivity in the ewes.

With the publication by Salmon and Geist[19] that testosterone increased libido in the human female, we considered possible synergistic action between androgens and pregnant mare serum. When 100 mg. of testosterone propionate were administered three days before PMS, 6 of 8 ewes came into heat as compared with 1 of 16 with PMS alone. Thus, its effect was positive, and 3 of 4 androgen-treated ewes sacrificed showed fresh corpora, indicating that the androgen had not inhibited ovulation.

Even with this pronounced increased sexual responsiveness, the percentage of fertile matings was not increased. The estrus produced was of longer duration, in some cases six to seven days, and the ewes evidenced marked tendency to mount each other. This is rarely seen in ewes in normal estrus but is a regular manifestation in the cow.

Superovulation is produced with 600 to 750 I.U. PMS, with increased production of triplets if pregnancy occurs, and as many as nine fresh, ruptured follicles found on postmortem in sacrificed animals.

Hogs.—In brood sows, a single heat period is not uncommon a few days following farrowing. Subsequently, no further estrus occurs, as a rule, until a few days following weaning. Cole and Hughes[20] experimented with the induction of estrus in lactating sows, using equine gonadotrophins. Estrus was not regularly produced before the fortieth day of lactation. With doses varying from 700 to 1,500 I.U. injected between thirty-nine and sixty-five days of lactation, 26 of 27 injected sows came into heat within three to seven days. Twenty of these sows were bred at the induced estrus, 19 became pregnant, the length of gestation was normal, and 3 to 15 pigs per litter were farrowed. The authors suggest that through this method the farrowing season can be concentrated by allowing early farrowing sows to breed normally at the end of lactation, and inducing estrus during lactation in those that littered late. It also would allow the young pigs to suckle longer, if desired, and still obtain two litters annually.

Dogs.—In bitches failing to settle after normal estrus and mating, gonadotrophins are indicated. These should not be given until thirty days or less before the next expected heat period. This is a general principle based on the knowledge that this hormone stimulates follicular development and estrogen production. The active corpora following ovulation counteract such stimulation through the presence of progesterone, and this action gradually wanes as time for new estrus manifestation approaches. Androgens have been used in the successful treatment of mammary tumors in bitches (Brockman[21]), and in certain noninfectious inflammatory processes of the genital tract in male dogs (Etienne and Robertson[22]).

SUMMARY

Evidence shows that hormone therapy has a place in veterinary practice. Clinical data on the treatment of domestic animals

with potent preparations are urgently needed. This will supplement scientific discoveries on laboratory animals. Considerable variation in chemical structure and physiologic response exists with the many commercial products available. Data should be reported on series of selected cases, using a single preparation at varying dose levels and spacing of administration. Data so collected will help to fill in gaps in present knowledge. This will improve efficiency of therapeutic application in some conditions and establish the need for its elimination in others.

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Bovine Uterine Prolapse

In prolapse or eversion of the uterus of the cow, the first step is to eliminate straining by the use of an epidural anesthetic. Keep the cow in a standing position, if possible; remove all fetal membranes, wash and clean the exposed surface, dust it with a sulfathiazole or urea powder, and protect the cleaned and powdered surface by covering with a clean cloth.

Inject 8 to 10 cc. of posterior pituitary extract intravenously and very slowly. When the uterus begins to contract, proceed to invert the horn and replace it through the cervix. If large quantities of serum have collected in the submucous tissues, it may be well to aspirate this fluid with a small trocar of a 14-gauge needle inserted at several points. External pressure should be applied to the area to expel the fluid. When this step is necessary, it must be done immediately after the intravenous injection in order to maintain proper timing.

Best results are achieved when the operator can be ready to replace the everted organ when the contraction is induced by the pituitary extract. If there is much delay, excessive contraction will defeat the purpose of the injection, and if the cervix contracts before the horn has been returned to its normal position the operator will find it impossible to complete the replacement.

Three interrupted sutures, or one purse-string suture, should be put in the skin 1 or 2 in. from the edge of the vulva. This distance reduces the danger of tearing out the stitches. If the animal begins to strain after the effect of the epidural anesthetic wears off, repeat the epidural and give tetanus antitoxin. The sutures may be removed in twenty-four to forty-eight hours.—*W. M. Coffee, D.V.M., La Center, Ky.*

Fracture repair is brought about by natural healing. A network of fibrin forms first and is permeated by capillaries. This mass is then organized into a fibrous provisional callus, which finally becomes calcified into the permanent callus. Healing requires from two and a half to eight weeks, depending on the age of the patient and its general health.—*R. E. Witter, Illinois.*

Studies on Vibrionic Abortion of Sheep

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ALTHOUGH infectious abortions due to a Vibrio have been reported in both sheep and cattle, by far the greater number of cases—in the United States—have involved sheep. In Wyoming and other sheep-raising sections of the West, the disease may assume great economic proportions with losses reaching a maximum of 50 to 60 per cent of the expected lamb crop. Included among the partially unclarified factors are: the manner in which the disease maintains itself from one breeding season to the next; the exact length of the incubation period; and the optimum period of susceptibility to infection.

In an attempt to evaluate some of the properties of *Vibrio foetus* which might influence the transmission of the disease, either from one breeding season to the next or from aborting to susceptible animals within the same flock, the viability of mixed strains of the organism at 37 C. (98.6 F.), 20 C. (75 F.), and 6 C. (42 F.) was determined. Three strains of *V. foetus* (Cambridge, Ovine IV; HI, Ward, Wyoming; and 2755, Marsh, Montana) were grown on 10 per cent blood agar plates; the resultant growth was suspended in 0.85 NaCl solution. The number of organisms per cubic centimeter was adjusted 1.5 billion. Prior to inoculation of test flasks, the viability of the suspension was demonstrated by streaking blood agar plates. Purity was determined by staining, followed by direct microscopic examination. One cubic centimeter of the viable suspension was added to each of nine flasks. Three of these flasks contained unsterilized alfalfa hay; three, unsterilized soil; and three, sheep manure. One flask of each material was incubated at 37 C., 20 C., and 6 C. At intervals of ten days, attempts were made to reisolate the organisms from each flask on blood agar plates. The results were as follows: At the end of ten days, all the flasks exposed to 37 C., 20 C., and 6 C. contained viable organisms. After exposure for twenty days, viable organisms could be isolated only from those flasks kept at refrigeration temperatures (6 C.). Viable organisms could not be demonstrated in those flasks exposed to 37 C. and 20 C. for twenty days. After exposure for thirty days, no viable organisms could be isolated from any of the nine flasks regardless of the material contained or the temperature to which exposed. This increased period of viability at colder temperatures is of interest as many cases of infectious abortion occur during the colder spring months.

To establish the probability of oral infection at various stages of pregnancy, and to attempt to determine the optimum period of susceptibility, groups of healthy, pregnant ewes were fed hay and water contaminated with live cultures of *V. foetus* isolated from cases of vibronic abortion, and injected parenterally with live cultures of *V. foetus*. These ewes were negative to agglutination tests for vibrionic infections and had no history of abortions or exposure to such infections.

Experiment 1.—Twenty healthy, pregnant ewes were divided into five groups of 4 ewes each. Group 1 was allowed to eat alfalfa hay and drink water contaminated with massive numbers of mixed strains of *V. foetus* during the first month following breeding. The four remaining groups were fed contaminated hay and water during the first two months (group 2), the first three months (group 3), the first four months (group 4), and the entire period of pregnancy (group 5). The hay and water were contaminated with a suspension of mixed strains of *V. foetus* (Cambridge Ovine IV; HI, Ward, Wyoming; and 2755, Marsh, Montana) prepared by suspending the growth from 10 per cent blood agar plates in 0.85 NaCl. The suspension was checked for viability by streaking blood agar plates and observation of the resultant growth. The suspension was standardized to a density of 1.5 billion organisms per cubic centimeter. While no attempts were made to measure quantitatively the final concentration of the contaminating organisms in the hay or water, nor the number of organisms which each sheep consumed, approximately 70 cc. per sheep of the standardized suspension was added at weekly intervals to the portions of hay and water fed to the animals. Viability of the contaminated feed and water was checked between

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times of recontamination by streaking blood agar plates.

Experiment 2.—Another group of 20 pregnant ewes were injected intraperitoneally with live *V. foetus* cultures during the first to fifth months of pregnancy. Five groups of ewes (4 to each group) were given by intraperitoneal injection a suspension of live *V. foetus* organisms. Each ewe received two injections of 10 cc. (each injection) of a suspension obtained by suspending the growth from three strains of *V. foetus* (Cambridge, Ovine IV; HI, Ward, Wyoming; and 2775, Marsh, Montana) on blood agar plates in 0.85 NaCl solution, standardized to a density of 1.5 billion organisms per cubic centimeter. Ewes in group 1 received intraperitoneal injections during the month following breeding; those in groups 2, 3, 4, and 5 received injections during the second, third, fourth, and fifth months of pregnancy, respectively. It was thought that the use of the intraperitoneal route would reduce, or at least minimize, the factors of variation in dosage (as in oral administration), variation in absorption from the digestive tract, and shock following intravenous administration.

A control group of 12 healthy, pregnant ewes bred with the same buck, at the same period as the two experimental groups, was kept under similar conditions of husbandry. The controls received the same diet as the experimental groups, 4 to 5 lb. of alfalfa hay per day per sheep. The water used for all groups was from the same source.

Attempts to recover organisms from internal organs of aborted fetuses were made by inoculation of 10 per cent blood agar plates followed by incubation in 10 per cent CO_2 atmosphere for thirty-six to forty-eight hours.

RESULTS

The results of experiment 1, in which the ewes were exposed to oral infection, were:

Group 1—4 healthy, full-term lambs.
Group 2—4 healthy, full-term lambs.
Group 3—4 full-term lambs—3 healthy, 1 weak (lived).
Group 4—2 full-term, healthy lambs; 2 full-term, stillborn lambs, *V.foetus* recovered from abomasum and liver of each.
Group 5—1 healthy, full-term lamb; 1 weak, full-term lamb (lived); 1 full-term, stillborn lamb, *V.foetus* isolated from liver and lungs; 1 ewe failed to lamb.

The results of experiment 2, in which the ewes received organisms by intraperitoneal injections, were:

Group 1—3 healthy lambs; 1 ewe failed to lamb.
Group 2—3 healthy lambs; 1 weak lamb (lived).
Group 3—2 healthy, full-term lambs; 1 weak lamb, died two days after birth, unable to isolate *V.foetus* from internal organs; 1 stillborn, full-term lamb, *V.foetus* isolated from liver and abomasum.
Group 4—2 healthy, full-term lambs; 2 weak lambs (lived).
Group 5—3 weak lambs, 2 of which lived and recovered; 1 died during first twenty-four hours of life, *V.foetus* recovered from lungs and liver; 1 stillborn, full-term lamb, *V.foetus* isolated from liver and abomasum.

The control group produced 11 healthy lambs; 1 ewe failed to lamb.

SUMMARY

In an effort to determine some of the factors involved in the transmission of vibrionic abortion of sheep, studies were conducted on the viability of three strains of *Vibrio foetus* at constant temperatures in various infective materials. Contaminated hay and water were fed to ewes in various stages of pregnancy; and ewes at various periods of pregnancy were given intraperitoneal injections of live *V. foetus* organisms.

It was found that the viability of mixed strains of *V. foetus* in hay, soil, and manure is approximately double when the temperature is decreased from 20 C. to 6 C. This viability is in close correlation with the incubation period as reported by various investigators.

Oral and intraperitoneal administration of mixed living strains of *V. foetus* to healthy, pregnant ewes resulted in abortions during the last month of pregnancy. Oral administration during the last two months of pregnancy resulted in abortions, while intraperitoneal injections during the third to fifth month of the gestation period produced abortions. *V. foetus* was recovered from all but 1 of the aborted fetuses.

DISCUSSION

CHAIRMAN MURPHY: Thank you, Dr. Lindenstruth. Any question?

DR. WALLER, Vermont: Is there any evidence that animals exposed during the first month or two develop immunity?

DR. LINDENSTRUTH: We obtained blood samples and ran agglutination tests. There was a very transient agglutination period, which disappeared about thirty days after the injections.

Lard, warmed to body temperature or a little higher, may be used in a dose syringe with a 9-inch nozzle for lubricating the birth canal of sows.—*J. B. Bryant, D.V.M., Iowa.*

The Role of the Veterinarian in an Artificial Insemination Program

GREG. R. RAPS, D.V.M.

Ames, Iowa

RECENTLY, I asked a representative of another bull stud whether they employed veterinarians in his organization. Without hesitation he answered, "Why no, there is no place for them in an artificial insemination program. Of course," he hastened to add, "we do sell semen to them for inseminating cows in their practices." I didn't press the point further. Later, the thought occurred to me that the remark had not been made because of a lack of careful consideration or because the veterinarian had been tried and found wanting. It was made because the man was, as are so many, uneducated about the scope of veterinary medicine. Why was this man harboring such a misconception? The answer is one that crops up time and again at meetings such as this—you and I have not completed our job of educating the general public about the abilities of the conscientious and well-prepared graduate in veterinary medicine.

On the basis of the remark of this college-trained man, I hope to bring to you some of the ramifications that have recently developed in the artificial breeding program.

Just one decade ago, the farmers of the United States were presented with a technique of animal breeding which will, in time, have an effect upon our dairy production as great and as beneficial as machines and hybrid seed have had on general farming practices.

The introduction of the technique had been of necessity slow. First, there was the lack of adequately trained men. Secondly, the problems inherent in setting up any new program had not all been faced and answered. The natural resistance of the average farmer to any new program whose benefits cannot be immediately recognized, as they can in the hybrid seed corn, had to be overcome. And, unfortunately, misunderstandings arose between the laity and the profession as to whom should administer the program.

We have only to look over the records published by the USDA to summarize the expansion of this program. According to the January, 1948, release, 43 states offered artificial insemination services to the farmer. I do not mean to infer that the states have complete coverage. Some have a limited service, usually confined to a few counties. Some have more extensive coverage. Many of the eastern and the midwestern states have nearly a complete coverage.

What do we mean by complete coverage? Ideally, insemination units, organized on a cooperative basis, would be located in each county, offering service to the patrons living in the area. Actually, such is not the case. However, it is the goal toward which all should strive. Why do I favor a coöperative unit? Like so many others, I failed to recognize what artificial breeding had to offer the farmer. Possibly, some of you practitioners from the East and maybe some of you from this coast have cattle practices in which the average cows have production records like those advertised for the breeds. Most of us don't.

There are two reasons for the type of cow seen on the average farm. First, the animal is often of the Heinz variety with ability to trace her questionable ancestry back to almost any breed. And once this lineage is established, the cow will be found to possess the most mediocre aptitude toward milk and butter fat production. Specifically, her inherited ability for production is either lacking entirely or of the poorest quality.

The second reason for the low production of the average farm cow is the atrocious rations from which this neglected animal is expected to produce milk. This, in turn, is further confounded by the methods and means used to take the milk from her. The feeding and management practices have room for great improvement. These are the challenging conditions which face a coöperative artificial insemination service. An artificial insemination service should be more than just a service. It must have a program. And a program that will be successful involves the participation of all. The most successful radio programs (according to Hooper ratings) are ones in which the audience participates. The same goes for agriculture. We will have our most successful program when the farmer, too, is a part of the program.

Artificial breeding is a technique of pure insemination service—if it is to be used solely for cow-freshening purposes. But, if that is to be the extent of its use, why should the bull studs scour the country for the finest bulls available? On the other hand, if we are going to use the best breeding in our dairy stock,

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should we not see that the offspring have a decent opportunity to express their inherited ability to produce milk?

We, in artificial breeding work, have seen the county coöperative as an opportunity to bring management and health practices to the ordinary farmer. Do not misunderstand me, for I do not mean that he has no other means to avail himself of the modern methods; he does. But not until the practitioner has ridden the back roads of some of our states does he realize how infrequently such practices, constantly written of in the farm papers, are used. However, once these farmers have become patrons of an artificial breeding coöperative, and especially after they have several calves from the service that look better than any heretofore, they become susceptible and aware of the possibilities of the program. They, as coöperators, have a stake in this program and then are ready to listen to advice concerning feeding and management. With the added value to these animals comes more individual care, which immediately involves the veterinary practitioner. And this brings us to our subject, the rôle of the veterinarian in an artificial breeding program.

The Practitioner and Breeding Coöperatives

The general practitioners have, in many instances, aided their clients in setting up an insemination unit. They have helped locate men who could be trained for the insemination work. Often, where the practitioner's training has permitted, he has helped train the technician.

Veterinarians have taken a sincere interest in the success of the organization and have conscientiously given their aid to the coöperative in every manner. As the interest has grown, they have helped the artificial breeding coöperative become a focus for general dairy education and advancement. As the program has developed, they have guided it into functional fields of real problems—mastitis control, expanded brucellosis supervision, and enlarged dairy herd improvement association work.

In many counties, veterinarians have opened their offices to the county coöperative association as a headquarters for their work and a telephone center for the technician's daily calls. Such an opportunity has a double value. The technician is under constant, if only superficial, supervision as to the cleanliness and attentiveness to his work. The veterinarian has a finger literally on the pulse of the organization, and its problems are not allowed to assume too large proportions before being questioned and answered.

Many veterinarians have offered their services directly to the farmers of their practice areas and are doing the insemination work along with their practice. We have a number of men who have been doing this successfully, using the breeding as an adjunct to general practice. This, necessarily, limits the number of farmers to which the service is available, for it logically becomes secondary in importance to strictly professional calls. For the most part, these men have taken a liberal view of the situation and have expressed their willingness to turn over the breeding to a trained technician when its demands exceed the time the practitioner can devote to it.

The Practitioner and the Bull Stud

The practitioner has yet another field—his professional relationship with the bull stud. A herd of 20 to 40 bulls presents problems quite apart from those seen in every day practice. Where each animal represents thousands of dollars of investment, the individual is of real concern. If I were to name the biggest problem of this type of work, it would be the care of the feet— specifically, trimming the hoofs to bring some semblance of normalcy to the average bull's underpinnings. Though this is of equal importance to other conditions which contribute to the expression of libido and serving ability, it is the most neglected.

Veterinarians, other than practitioners, also have a stake in artificial breeding. There are a number who have entered artificial breeding work as full-time men. In Wisconsin, Dr. W. H. Dreher, of the Badger Breeder's Coöperative, heads a staff of eight veterinarians and supervises, with this help, all the technical phases of the program. These veterinarians carry the professional work even further than is being done in many areas. They are able to do much consultation work with practitioners and are also available for pregnancy diagnoses within the areas of their technician's coverage.

Research in Artificial Insemination

The research problems of artificial breeding work, if generalized, fall into two main categories: (1) increasing the efficiency by improving the mechanical processes involved in artificial breeding; and (2) increasing conception rates by advancing our knowledge of the physiology of reproduction not only in the female but also in the male.

Except for such pioneers as Drs. H. E. Kingman, J. A. Henderson, and G. K. L. Underbjerg, veterinary participation in these problems has been small.

Methods of handling semen from collection through dilution, cooling, and packaging have

remained virtually unchanged for the past decade. The handwork necessary to prepare 1,000 or more vials of semen, the labeling, pouring, and corking is still done without mechanical aid. These tedious procedures are done when time is of the essence—between collection and shipment. The introduction of labor-saving devices are needed.

Field techniques have remained relatively unchanged except for two things which should be noted. Most breeding is now done without violating nature's barrier to the susceptible uterus. Formerly, the insemination pipette was placed well into the horns of the uterus for semen deposition. Now, it is the practice to refrain from complete penetration of the uterine cavity and to place the semen one-half to two-thirds of the way into the cervical canal.

A second innovation has been to restrict the semen dosage from the earlier amounts of 1½ to 2 cc. to as little as 0.25 to 0.33 cc. As smaller amounts are used per cow, the degree of dilution at the stud can be proportionately less.

But with these improvements, the rectal method of cervical manipulation still remains the rectal method. Certainly, Mother Nature did not intend that the privacy of the cow's rectum be violated to obtain a natural conception rate. There must be a simpler way to inseminate cows without sacrificing efficiency. The young veterinarian with the tinkering soul and a working knowledge of the anatomy and physiology of the estrous cow, who will develop an insemination technique that will approximate natural conception, with elimination of the rectal invasion, will receive the undying gratitude of hundreds of artificial breeding technicians.

We realize that increasing efficiency through a greater knowledge of reproduction is a great undertaking. To further our working knowledge of this will take the combined efforts of anatomists, physiologists, nutritionists, biochemists, and geneticists. Such an attack on all fronts really involves coöperative effort. Several agricultural experiment stations are considering such projects to be carried out through funds available from the Hope-Flanagan Bill.

The work at the University of Wisconsin, in conjunction with the Badger Breeder's Coöperative, appears to be producing data that will be a real contribution to our knowledge of early embryonic mortality. The fact that many cattle apparently not conceiving, as evidenced by repeated normal estrous cycles, and yet upon examination yielding fertilized ova, may bring up for consideration possibilities in sterility problems never considered heretofore.

A survey of the present day literature reveals that the animal physiologists have taken over much of the fundamental study on reproduction, as they have the actual artificial breeding programs. Why haven't the younger veterinarians taken to these fields as they have to so many of related subjects? Two reasons seem logical. First, the lower starting salary, which does seem small when compared with other fields. Something must be missing in our veterinary indoctrination, for the service end of veterinary medicine is lost sight of immediately when the remuneration is not the highest possible. Some step in the education of the veterinary student seems to be lacking when other than monetary return for work done is not considered. There is a satisfaction to be gained in knowing that, through one individual's efforts, others will be given an opportunity to enjoy more abundant life. Artificial breeding and all its related fields are doing just that for many marginal farmers who never before have had the chance to build a good dairy herd. In artificial breeding, we must look beyond today's service fee to returns that may be received when these better herds are developed.

The second reason for lack of interest in the artificial breeding work, I believe, is that it is not included in the curriculums of veterinary colleges. Without training, it is difficult for the veterinary graduate to step directly into an organization and be of real help. The student, though having a basic knowledge of part of the work, has had no opportunity to correlate it with the many other features that must be considered. Several agricultural colleges are offering courses in artificial insemination to their seniors and graduate students, and it is easy to see why the neophyte veterinarian is unwilling to enter a field more familiar to others than to him.

RESULTS OF RECENT RESEARCH

I had planned to bring to you some of the latest information concerning the newly reported research in the field of artificial breeding. We can scarcely confine it to artificial breeding, for the work laps over into what we should rightly call the physiology of reproduction. This summer, in June, the annual meeting of the American Dairy Science Association was held in Athens, Ga. The meeting was comparable in attendance to this one, and for one of real interest and quality of work reported, it was excellent. A half day was spent in reporting the various data from the several experiment stations doing work in artificial breeding. Again, let me emphasize, the number of veterinarians in attendance was pitifully small; off-hand I can recall only about five, and two of those were from Iowa.

One of the first papers to be given, by Shaffer and Almquist of Pennsylvania State College, reported the use of easily obtainable dyes as substitutions for the vital staining of spermatozoa involving the use of opal blue (Breslau formula) which, since the war, has been impossible to obtain. These men reported the use of eosin blue and aniline blue prepared in a buffered diluent which, used according to their procedure, would result in a differential staining of the live and dead sperm (at the time of the slide preparation). This again is an example of what any practitioner in a dairy area might have to offer his clients when they come in for an examination of a bashful bull. The material is available in reprint form and can be obtained by writing Dr. J. O. Almquist, Pennsylvania State College, State College, Pa.

Almquist further gave data collected from 5 bulls upon which the semen samples had been fortified with 1,000 units of penicillin per cubic centimeter. The bulls had been selected for their low fertility records and subsequent checks made on the samples so treated revealed a 15 per cent increase in the number of cows appearing to settle to the semen from these bulls. He also stated that the use of 1,000 units per cubic centimeter completely inhibited bacterial growth.

The fundamental studies on the presence, quantitative determination, and activity of the enzyme hyalurodinase in bull semen were reported in progress by the workers of the New Jersey Agricultural Experiment Station. The ultimate results of such research on the field of breeding cannot be envisioned, but the possible addition of supplemental amounts of this enzyme might some day allow the use of dilutions as yet undreamed of.

Dr. J. F. Sykes and coworkers, of the U. S. Bureau of Dairy Industry, reported on the damaging effects, as evidenced by changed semen characteristics, resulting from the subjection of a bull to testicular biopsy. This is a point which has bothered veterinarians for many years. This work will, no doubt, arouse some question, particularly among medical men who have advocated the use of testicular biopsy as practicable diagnostic procedure.

From the University of Missouri, Dr. H. A. Herman and his coworkers submitted some interesting data involving the use of the English-designed "estroscope" to determine the "flow elasticity" of the estrous mucus. This work showed that the estrous mucus was of the highest flow elasticity with the onset of heat, and that it progressively lost this characteristic with the completition of estrus. On the other hand, while the mucus is losing one characteristic, it is gaining another. The penetrability of the mucus to spermatozoa reaches a peak during the sixth to twelfth hour of heat, when it, too, regresses. On the 80 cows recorded, the volume of the mucus liberated from the vagina was the greatest during the early stages of heat.

The use of d-l thyroxine in semen samples, in an attempt to maintain a higher conception rate than is normally expected from stored semen, was explained by Dr. Shultze of the University of Nebraska. In this work, 10 μg./100 cc. of thyroxine appeared to maintain, on four-day-old semen, a conception rate 7 per cent above that normally expected. Some bulls gave as much as a 12 per cent response to the treatment; the poorer bulls were affected adversely, contrary to what one would anticipate.

Dr. Barrett and the Wisconsin men gave a progress report on the work which had been discussed the previous year—the relative efficiency of using the so-called "nonreturn cows" as an indicator of the actual percentage of conception. When only a short period (30 to 60 days) is used in computing the nonreturns, there will be a 15 per cent discrepancy between the number not having returned to heat and the number that have actually conceived and are known to be carrying a fetus. However, they showed that, where a period of ninety to 120 days had elapsed before figuring the animal as settled, the error would be less than 3 per cent.

In another study of the Wisconsin Agricultural Experiment Station, in which the data of 14,000 inseminations were used, the percentages of cows settling to each successive insemination were reported. The old rule that one-half of the cows bred each time will settle still holds reasonably close to the material presented. On first service, 54 per cent became pregnant; on second, 50 per cent; and on the third, 46 per cent.

CONCLUSION

In conclusion, may I thank you for your attention and for the pleasure I have received in giving to you my interpretation of the veterinarian's rôle in an artificial breeding program. To me, the opportunities for a veterinarian are many, varied, and inviting.

To the conscientious practitioner whose first interest is bringing to his clientele a better way of life, there is the satisfaction that, through participation in a well-planned artificial breeding program, he can do just that; that, through coöperative effort, a better farmer will develop in his area.

To the veterinarian engaged in full-time work, there is the knowledge that he is bringing to many farmers a new view, a new understanding of veterinary medicine. To those who had previously considered the veterinarian only in an emergency comes

a realization that there are more profitable ways to employ this professional man.

To the man of the inquiring mind, the research veterinarian, is thrust a truly great challenge. Here, in his hands, rests the opportunity to lead, and to bring to the artificial breeding program even greater efficiencies for the American dairyman.

DISCUSSION

CHAIRMAN JOHNSON: Are there any questions?

DR. BALL (Calif.): What is the percentage of dilution? You spoke about cutting down the amount.

DR. RAPS: In Iowa, we are using from 1:45 to 1:60 dilution, and using from 1/3 to ½ cc. of that dilution. Mr. Johnson, the manager of the New York artificial breeding organization, told me at Athens, Ga., that they had gone as high as 1:200 dilution, and that there had been no drop in the conception rate with that dilution. This hasn't been published as yet.

QUESTION: Can you tell us, again, the comparable conception rates between the intracervical and the intrauterine method?

DR. RAPS: In our study, we found that transferring to the intracervical from the intrauterine method made no change in conception rate, but going from the speculum method to cervical manipulation—where the semen was placed more deeply in the cervix—did change the conception rate. In our work, it increased the efficiency about 8 per cent, and we had just as good results when the semen was placed only one-half to two-thirds of the way through the cervix as compared with deeper deposition by penetration of the whole cervix. The work can be done much faster with shallower deposition.

CHAIRMAN JOHNSON: I wish to thank Dr. Raps for his discussion.

Spontaneous Abortion in a Bitch

An 8-month-old Beagle, cross, female was presented with the history that the dog had been missing for several days and was now vomiting and had a severe diarrhea. One month previously, the animal was in heat and was mated by an unknown male. No distemper immunization had ever been given. A tentative diagnosis of gastroenteritis was made, with a possibility of distemper. Antiserum was administered as were antidiarrheal drugs and gastric sedatives. The animal responded favorably to the medication.

One week later, the animal was dull, listless, and refused to eat. It had a bilateral discharge from the eyes and a temperature of 105 F. A diagnosis of distemper was made, and the animal was hospitalized. Penicillin and supportive treatment were administered. Four days after admission, the animal aborted.

According to the literature, pregnant bitches having distemper at time of pregnancy appear to have a much milder case and recover with little ill effects.

This case is interesting because (1) a virus disease caused abortion in an animal about one month pregnant; and (2) because of the comparatively mild type of distemper and favorable prognosis.

I would appreciate knowing if any other practitioners have had spontaneous abortions in bitches having distemper concurrently with pregnancy.—*S. M. Kessler, D.V.M., 2721 Ft. Hamilton Parkway, Brooklyn 18, N. Y.*

Nose Operation

For years, veterinary colleges and dog-breeding circles have said that the short-nosed breeds of dogs, particularly Boston Terriers and Pekingese, have difficulty in breathing. This has been said so long and so often that most of us have accepted the fact as applying to all short-nosed dogs and have given up attempting to do anything about it. The most serious trouble occurs during the hot weather when all dogs naturally breathe faster and harder, and those with an obstruction in their respiratory passages have to work very hard to breathe. The harder the dog works, the higher the temperature rises and the more excited the dog becomes. This makes breathing even more difficult and more rapid until, finally, the distressed animal succumbs to heat exhaustion.

Many dogs are in poor condition because they do not breathe or exercise properly. A number of these cases, upon examination, will be found to have a pliable upper parietal cartilage of the nostril, which acts as a one-way valve—opening to allow air to be exhaled easily but closing to permit very little or no air to be inhaled through the nose. An effective operation can be done on such cases.

The dog is prepared for surgery in the usual way. A general anesthetic, preferably pentobarbital sodium, is the most effective in this operation. If local anesthesia is used, it is attended by sneezing. There is also difficulty in controlling the head, as the area is quite sensitive. Infiltrating the area with adrenalin chloride before operating greatly reduces hemorrhage.

While an assistant holds the dog's head firmly, the operator removes the end of the flap of upper parietal cartilage which occludes the breathing. This is done with a short, strong, narrow pair of scissors, either curved or straight. Sometimes it is necessary to take out more of the cartilage by cutting farther up in the nostril. The wound will bleed freely since the area is highly vascular. Often it is unnecessary to control this bleeding but, in persistent cases, an application of ferric chloride will suffice. No suturing is necessary. To

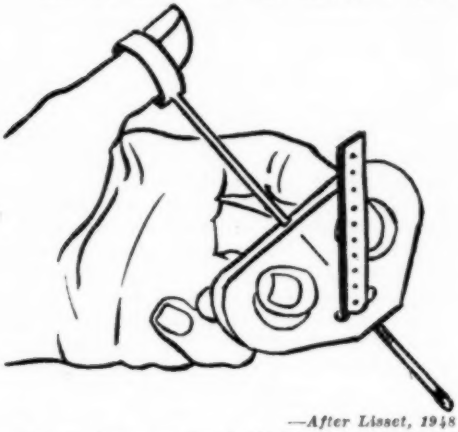
avoid suffocation, the nostrils should be wiped free of blood at frequent intervals until the dog has completely recovered from the anesthetic. The patient's nostrils will appear unsightly for two or three weeks, but the inflammation will recede and pigment will gradually return to the area. Immediately following the operation, the dog breathes normally.

This operation has been performed on approximately 50 dogs, primarily Boston Terriers and Pekingese, in the past fifteen years. They all had similar histories when presented: poor physical condition, unthrifty, susceptibility to respiratory infections, and marked discomfort in hot weather. Almost invariably, when the patient is presented several months after surgery, it is difficult to realize that it is the same animal, as the general condition is so greatly improved.—*R. L. Trader, D.V.M., 112 W. Division St., Chicago, Ill.*

Hormonal Castration of Domestic Fowl

Young males of any of the domestic fowl —cocks, toms, drakes, ganders—can be successfully castrated by the simple process of implanting a pellet of diethylstilbestrol into the subcutaneous tissue, according to published reports. The bare statement is given conditionally in this column, because categorical information as to the extent to which the method is practiced in this country has not been easy to obtain from the poultrymen interviewed, and because veterinarians in general have not shown sufficient interest in the subject to write articles about it.

Dr. Frank C. Tucker, Claypool, Ind., whose views on poultry practice problems are known to stem from a wide experience, gives his views on the matter in an article soon to be published. Briefly, he reports that 15-mg. pellets are inserted under the skin at the base of the comb or at the proximal level of the axis, where any remains of the material implanted are removed by decapitation at the time of slaughter.



—*After Lisset, 1948*

Fig. 1—Apparatus for implanting diethylstilbestrol pellets.

—*After Lisset, 1948*

Fig. 2—Showing degeneration of the comb in thirty days, during which time the capon's weight increased from 5.5 lb. to 7.04 lb.

Using a trocar and cannula, pellets are implanted into young and small cockerel Leghorns and Black Minorcas about 4 months old and weighing from 3 to 5 lb. The treated birds are then separated from the flock, because they lose their fighting tendencies and are run all over the lot by the untreated birds. In a week or so, the large, red comb shrinks and gets pale, the bird becomes less active, it gains weight more rapidly, and fat infiltrates the muscles to make the meat more tender. In about two weeks, the treated bird acts like hens do when no males are with them—they cluck like hens and squat when approached. After about a month, the male characteristics begin to return. Roosters 1½ years old have reacted similarly, and the quality of the flesh is excellent.

For cockerels, the veterinarians of France* use a similar pellet, implanted with a special apparatus (*see* fig. 1) consisting of a plunger and a perforated carton holding the pellets, which the plunger engages in the process of completing the implant. The operation requires but a second or two.

To produce the heavy yearling capons of surgery, the hormonal implant must be repeated when masculine traits begin to reappear.

*Bull. Acad. Vet., 21, (Nov., 1948): 361-364.

In a herd experiencing an abortion "storm," vaccination of negative cows pregnant less than three months is indicated, whether previously vaccinated or not.—*C. M. Haring, California.*

CLINICAL DATA

Clinical Notes

America needs 6,000,000 calves a year in order to replace 1 of every 5 milking cows, because the average milking life of a dairy cow is five lactation periods.—*E. A. Woelffer, D.V.M., Wisconsin.*

Infusion of the mammary gland may be successful when aqueous solutions of sodium sulfamethazine (50 cc. of a 10 % solution) plus 50,000 units of penicillin are injected at intervals of twenty-four hours, three to six times as needed.—*M. G. Fincher, D.V.M., New York.*

Louping Ill in Man.—Physicians in Newcastle-on-Tyne, England, report (*Lancet*, Sept. 18, 1948) 2 cases of louping ill in agricultural workers. The disease is prevalent among sheep of this area, and the men are believed to have been infected with the virus by ticks.

Curare in Tetanus.—Treatment for six and a half days with a derivative of curare (*d*-tubocurarine chloride) is believed to have promoted recovery from tetanus in a 16-year-old boy (*Brit. M. J.*, Dec. 11, 1948). Physicians reporting the case were cautious in projecting the possibilities of the curare treatment, though they pointed out that this drug "combined with other measures may find a useful place in the treatment of tetanus."

Effect of 2,4-D on Chickens.—Unless a 2-lb. chicken is capable of consuming all the 2,4-D-treated plants on a 72-ft. square plot within a couple of days, plants sprayed with this chemical are not immediately dangerous to poultry, Bjorn and Northern, University of Wyoming, conclude from their experiments. Stated in a different way, it was found that "at a spraying rate of 1 lb. of 2,4-D/acre, a chicken weighing 1 kg. would have to consume all of the 2,4-D applied on 72 sq. ft. within a day or two to obtain a lethal dose."—*Science, Oct. 29, 1948.*

The secret of the success of the streptomycin-sulfadiazine treatment for brucellosis in man is the synergistic action of these two drugs on Brucella organisms, according to Shaffer and Spink, of the University of Minnesota.

Mastitis Control.—Observations made on 658 herds by Plastridge and Hale (*Cornell Vet., 38*, July, 1948: 285-306) show that *Streptococcus agalactiae* mastitis is a specific, contagious disease and should be handled as such. The disease cannot be eradicated by management alone, nor by treatment of clinical cases as they appear.

Alfalfa Research Receives Impetus.—A significant announcement says that most of the major companies producing dehydrated alfalfa meal are pledged to support financially (10c per ton of alfalfa meal) a seven-step research program for the: (1) production of better alfalfa; (2) harvesting and processing of alfalfa; (3) stabilization of carotene and color; (4) grade standardization; (5) evaluation for known and unknown nutritional factors; (6) developing of new uses; (7) investigation of economic uses in animal feeds. The program will be under the direction of a research committee, according to *Feedstuffs* (Feb. 26, 1949).

Insecticides Compared.—Edgar and King, Alabama Agricultural Experiment Station (*Poult. Sci.*, Sept., 1948), compared the killing properties of seven insecticides in different combinations and strengths on 5,000 lice-infested chickens in 140 pens. DDT, methoxy DDT, benzene hexachloride, chlordane, sulfur dust, sodium fluoride, and black leaf 40 were tested on chickens of different breeds naturally infested with four different species of lice. Dusting, dipping, group spraying, fumigating, painting roosts, and sprinkling litters were the methods of application. Summed up, all of the seven were found to be satisfactory, but none excelled over sodium fluoride.

Symposium on Veterinary Pediatrics

At the San Francisco Session of the Association, the Section on General Practice conducted a symposium on the diseases of newborn animals. The members of the panel were Dr. John Britton, Willits, Calif., moderator; Dr. W. J. Gibbons, Auburn, Ala., Raising Calves; Dr. Geo. A. Young, Jr., Austin, Minn., Swine Pediatrics; Dr. Floyd Cross, Fort Collins, Colo., Problems in Raising Lambs; and Major B. F. Trum, Fort Robinson, Neb., Diseases of the Foal. The following is a condensation of the remarks of the symposium participants.

Moderator John Britton (Willits, Calif.).—This discussion is prompted by a desire to stimulate interest in diseases of newborn animals, so that all veterinarians may more effectively help the livestock industry reduce the tremendous losses which result from the death of newborn calves, pigs, lambs, and foals. As Major Trum is unable to be here, Col. Wm. E. Jennings will read his paper. Dr. Gibbons, will you proceed?

Raising Calves

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The successful economy and disease control in cattle herds depends to a great extent upon the calf crop. No cattle herd can be operated profitably without success in raising calves. The raising of replacements on the farm is a prime measure in the control of many diseases acquired by purchased additions. A successful calf crop usually means a successful herd. The health of a calf is influenced by many factors in both its antenatal and postnatal life.

Healthy offspring are the result of the mating of two healthy individuals. The breeding hygiene and the prevalence of genital diseases in any given herd have a direct bearing on the number of offspring and the percent of fatality of the young calves. Those which are raised free from infections grow vigorously and are mature at breeding age, and are usually more resistant to disease and better producers. The factors of heredity, breeding hygiene, and nutrition deserve just as much recognition in the bovine species as in the breeding problems of the equine species. Certain purebred families of dairy cattle have been notorious for the production of unhealthy offspring. Early breeding of cows with questionable genital tracts is apt to result in sterility due to unseen abortions, abortions, and weak, unthrifty calves, the same as the ninth day breeding of mares results in a similar syndrome.

Proper feeding of the pregnant cow is an important factor in raising healthy calves. The nutrition of the dam should insure sufficient minerals and vitamins during pregnancy and adequate storage so that colostrum will be rich in these elements. The birth of weak calves or the expulsion of dead fetuses at term is a frequent occurrence in mineral and vitamin deficient herds.

When the young mammal crosses the birthline from prenatal to postnatal life, it experiences abrupt changes in its environment and in the physiologic activities of systems and organs. The diseases and dangers surrounding the newborn are infinite. In a short discussion of this type, only a few details of the principal postnatal factors in raising calves can be dealt with.

The principal factors involved in the well-being and health of calves in early life are included in nutrition, hygienic measures, specific infections, and parasitisms. Much has been written about the rôle of nutritional elements in growth and prevention of diseases common to the young of the bovine species.

There is still considerable controversy concerning the use of vitamins in the prevention and cure of calf diseases. Practical field tests, carried out on large numbers of dairy calves, failed to prove the value of administration of vitamin formulas, but their use would seem to be justified by our knowledge of the nutritional needs of calves, especially where the cow's diet has been lacking and the calves are not vigorous at birth.

There is no evidence that calves suffer from nutritional anemia to any extent. The calf is not naturally a fast-growing animal and the nutritional requirements are not as exhausting to the body as in other species, such as the pig. On the other hand, it is possible that the lessened supply of certain elements may retard growth and vigor of the calf and thereby lower its resistance. Lack of iron and copper does not cause nutritional anemia in older calves. The health of the calf crop in a grazing herd is greatly influenced by the fertility of the soil of the grazing area. Cobalt deficiency,

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such as occurs in the southeastern United States, causes weakening and death of the calves within two to six weeks after birth. This occurs with the cows on good grain rations and apparently excellent alfalfa hay.

Much has been said and written about the influence of hygienic factors on diseases of dairy calves. The influence of poor housing, poor ventilation, chilling, and close confinement in relation to the etiology of calf diseases has been stressed for many years, yet the incidence of diseases of the newborn is greatest in the large and more prosperous dairy herds in which the housing facilities are usually excellent from the standpoint of stable construction.

In relation to hygiene, the adherence to some closely supervised method which can be regulated and controlled is recommended. Any system of raising calves should include a definite feeding system, some method of housing which will isolate the calves into small groups, especially in relation to age, and the early recognition and control of abnormal conditions.

The day of elaborate calf barns and nurseries seems to be definitely past. During past years, calf barns have been reconstructed with many new types of ventilation, various methods of artificial heating in cold climates, different kinds of isolation pens, and many means of disinfection. For the most part, these have been to no avail when many calves of all ages were assembled under the same roof. A number of years ago, it was discovered that, in large dairy herds where pneumonia was a paramount cause of calf mortality, that when the calves were divided into small groups and new calves raised separately, the spread of infection was checked to a great extent.

From this, there has evolved a system of raising calves in small housing units of not more than 10 or 12 calves. This system has the following advantages: (1) rearing according to age, (2) more individual attention in feeding and care, (3) early recognition of abnormal conditions and behavior, and (4) easy segregation and control of disease conditions.

TREATMENT

The therapeutics of calf diseases can be considered under general care, supportive treatment, biological injections, and drug therapy.

Under general care, the calves should be provided with warm, dry quarters; be given proper hygienic attention at birth; and be kept well stimulated until they become fully adjusted.

Supportive treatment should be used more generally in the treatment of calf diseases. On this point, the small animal practitioner can serve as an excellent model. Glucose, saline solution, and blood transfusions from the dam are highly effective.

Among the biological products advocated are bacterins, aggressins, and serums. We can dispose of the bacterins by saying that only the autogenous bacterins offer any hope, and they are not fully dependable. Aggressins are also of doubtful value. The most effective biological treatment is 250 to 500 cc. of the dam's blood within an hour or two of birth, and a pint or two of colostrum ingested just as soon as the calf is able to stand and nurse. Other types of specific commercial antiserums are used because they are more convenient, but they are less effective than the dam's blood.

In the field of drug therapy, three sulfonamides are effective: sulfapyridine, sulfamerazine, and sulfamethazine. They should be used at an initial dosage of 1 to 1½ gr. per pound of body weight, and supportive doses of ½ to ¾ gr. per pound daily in divided doses. Penicillin and streptomycin are being used in isolated instances. However, much needs to be learned about them before they can be recommended for general use in everyday practice.

Swine Pediatrics

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The consideration of hygiene and disease, as related to suckling swine, is of great importance to the veterinary profession. We rely on swine more than on any other species to supply the nation's meat I think we need to apologize, however, for the inefficient manner in which this need is met. True enough, swine are the most efficient meat-producing animals, but the fact that only 6 pigs out of 10 farrowed reach market age increases the cost of producing pork for the table by a substantial margin. Since most of the loss among swine occurs in the first two weeks, swine pediatrics should command the serious consideration of the veterinary profession.

At the present, it is not even possible to determine quantitatively the primary causes of death in newborn swine. Admittedly, the general categories of loss are: faulty management, inadequate nutrition, and disease. There are many who make an empirical break-down of the over-all losses, holding faulty management responsible for

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half of the losses and inadequate nutrition and disease responsible for the other half. From my personal viewpoint, disease, as a factor in baby pig mortality, has been under-rated. Since, in considering the average farm herd, it is difficult if not impossible to determine into which category the losses should go, let us turn to information gathered from herds on which adequate records are kept and discuss the relationship of faulty management, inadequate nutrition, and disease as contributing factors in suckling pig mortalities.

First, let us consider management. If 50 per cent of the baby pig losses in our well-managed herds must be placed in this category, then something is wrong with our animal husbandry people. I doubt that they have been so deficient in their proposals for procedures to reduce baby pig losses. If we establish an arbitrary 10 per cent allowable loss for management, then losses in excess of 10 per cent should be due to other factors. Since many well-managed herds have losses which vary from year to year under the same system of management, frequently reaching serious proportions, factors other than faulty management must contribute to these losses, especially when they exceed 10 per cent of the pig crop. We must, then, turn to the other two categories, *i.e.*, inadequate nutrition and disease, for an explanation of the losses.

When the relationship of nutrition to baby pig mortality is considered, three-day sickness,[1] hypoglycemia,[2] and acute uremia[3] are ailments which are generally associated with inadequate nutrition of the dam. These conditions are so similar that it is often impossible to differentiate between them. In fact, it is my personal opinion that these conditions are primarily different manifestations of one or more virus diseases, rather than a result of nutritional deficiency.

For the sake of discussion, let us consider that three-day sickness, hypoglycemia, and acute uremia are the same malady. Also, we will assume that the condition is caused by inadequate nutrition of the dam during gestation and lactation. Thus, we have a single malady caused by inadequate diet of the dam. This established, if we have similar management at different experiment stations, the same or similar rations should produce comparable losses among newborn swine at all of the stations. This does not hold true in actual practice. For the past two years, experiments have been conducted at Iowa State College[4] with a basal ration similar to those used at the universities of Illinois, Wisconsin, and Missouri, where high losses were experienced, in an effort to produce high mortalities among newborn swine. At the Iowa station, however, the high losses that had been anticipated did not occur. In fact, the Iowa experiment produced more than 6 weaned pigs per litter, as contrasted to weaning percentages of only 7 and 13 per cent at the Illinois station. Since the Iowa herd is on clean ground, while the Illinois herd has been maintained for many years on the same ground, this difference in performance of pigs on similar rations at different stations has been attributed to a difference in environment.[4]

Further evidence that nutrition is not the primary factor in baby pig mortality is provided by our experiences at Austin. The herd was set up originally as a breeding herd, but, within a year of its origin, high losses occurred among the newborn pigs. Even though the ration appeared adequate in every way, the losses were believed to be of nutritional origin, and experiments with different rations were begun. On approximately 1,000 litters of swine over a three-year period, the results of these attempts to reduce losses by improved diet were discouraging. No differences in mortality were observed between pigs farrowed by dams fed in drylot and those farrowed by dams having the same ration while on good pasture. Nevertheless, during the spring of 1945 when our pig losses ran over 80 per cent, it was suggested that the losses would cease if the dams were placed on pasture. Arrangements were made to do this, but before the pastures could be readied, the losses stopped of their own accord. Had the dams been placed on pasture a week or two earlier, a miraculous curative value would have been attributed to the pasture, although, obviously, this was not responsible for the marked and sudden improvement in our herd in 1945.

For the past two years, we have used a standard gestation ration for dams during the first months of pregnancy consisting of 35 per cent cracked corn, 21 per cent ground oats, 21 per cent ground barley, 10 per cent dehydrated alfalfa meal, 4 per cent soybean meal, 4 per cent tankage, 3 per cent linseed meal, 1 per cent iodized salt, and 1 per cent bone meal. During the winter months, 900,000 units of vitamin D were added per ton of feed. During the last months of gestation, the protein concentrates were increased by 5 per cent at the expense of the cracked corn.

In the light of our present knowledge of swine nutrition, it would be difficult to say that the ration just described is not adequate for nourishment of both the dam and pigs during gestation. In fact, although we have had our dams on this ration, we

have had, periodically, high mortalities among newborn pigs. The losses have been seasonal. In the face of a dietary and management program that appears to us to be entirely adequate for the successful production of swine, we have experienced high mortalities, especially in pigs less than 10 days old. Thus, we have been forced to look toward disease, rather than management and nutrition, as the primary cause of our baby pig losses.

A year ago, we published a paper[5] on an epizoötiologic study of baby pig mortality. The data for this study were taken from mortality records on more than 1,000 litters of swine which showed a 40 per cent mortality in suckling pigs. Since most of these losses occurred during the first ten days after birth, a wealth of data on baby pig losses was available. From these data we were able to establish a working hypothesis for subsequent studies on baby pig mortality.

The hypothesis was essentially as follows: (1) The dam undergoes a viral infection, either clinical or subclinical, during gestation which results in the stimulation of antibody to overcome that infection. (2) Simultaneous sensitization of the fetuses with the viral antigen or hapten occurs *in utero*. (3) At its first feeding on the antibody-rich colostrum of the dam, the sensitized newborn pig is subjected to reversed anaphylactic shock. By this theory, shock is held responsible for the death of the pig whether death occurs immediately or several days later.

Since we had an obvious hog-cholera problem in our herd at the time of the heaviest losses, our first attention was given to the hog-cholera virus as a possible cause of baby pig losses by this indirect means. Experiments with eight litters of pigs, farrowed by hog-cholera immune dams reinjected with hog-cholera virus during late gestation, indicated that hog-cholera virus was not the principal agent causing the baby pig losses. Similarly, studies with pseudorabies virus on six litters indicated that this virus, although responsible for an extremely high incidence of stillbirths, did not produce the so-called baby pig disease syndrome.[6]

As indicated at the AVMA meeting in Cincinnati in 1947, we intended to screen the common viruses affecting swine and return to the one which looked the most promising for an intensive study. Hog cholera and pseudorabies did not show much promise as instigators of the type of ailment with which we are dealing. As our herd has been maintained louse-free for the past year and no pox have been noted, swine pox can be eliminated from consideration as a factor in our herd. We have left for consideration, then, swine influenza virus, which from our viewpoint shows excellent promise of being the agent for which we are looking.

During the past year, we have made a concerted study of swine influenza as a factor in baby pig mortality. We have found that prenatal debilitation and active infection of the newborn swine must be considered along with reversed anaphylactic shock. Apparently, these three manifestations of swine influenza can appear simultaneously in a single herd. Each is characterized, to a certain extent, by the different pathology it causes, which suggests that classification of baby pig ailments on pathology alone, *i.e.*, enteritis, congested or fatty liver, kidney urates, or bronchopneumonia, is not adequate. Thus, it appears that we must leave the nomenclature for baby pig ailments alone until such time as the specific etiology has been worked out.

We are sufficiently encouraged with our findings of the past year on the relationship of swine influenza to baby pig mortality to plan to study this problem for at least another year. Whether or not our present production of 7.7 weaned pigs per litter* is due to the fact that two-thirds of our dams have been vaccinated for swine influenza is something we are interested in checking for ourselves. In this type of work, it is always possible that mother nature may mislead one on results based on a single season.

So far as this session on veterinary pediatrics is concerned, the important thing to consider is the possibility that virus disease in the dam during gestation may greatly influence the livability of the offspring. This relationship has been well established for Rubella (German measles) infections during the first months of pregnancy in women, and we have circumstantial evidence that swine influenza in the dam during gestation affects the livability of the pigs carried. I suggest that we should be watching the newborn of other domestic animals for similar relationships between viral disease of the mother and the livability of the young. I have given some thought to the similarity of calf scours and baby pig disease. Perhaps you may think of others.

I am aware that the above interpretation of baby pig mortality is contrary to general opinion. However, differences of opinion are stimulating and criticism is essential to research. If I do nothing more than make you aware that the baby pig

*Based on 60 litters farrowed consecutively during April and May, 1948.

mortality problem is far from solved and that virus diseases must still be given consideration as possible primary factors in these mortalities, I shall feel well repaid for my time. At the discretion of the panel chairman, I will be very glad to answer, to the best of my ability, any questions pertaining to swine pediatrics.

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Problems in Raising Lambs

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Diseases of lambs can be caused by poor management and by malnutrition. Beginning with the latter, vitamin A is particularly important in breeding ewes and young lambs. We see many flocks where the ewes are deficient in vitamin A. As a result, they abort or bear weak lambs, which are unthrifty and unprofitable. Avitaminosis A is also responsible for many postnatal infections in lambs, and it causes tremendous losses from infections which attack unthrifty and unresistant lambs.

Another important problem in range ewes that can be controlled by proper management is lambing paralysis—also called acidosis, ketosis, and preparturient paresis. It occurs in ewes wintered on the desert, particularly on the west slope of the Rockies. As the ewes approach lambing time, they begin to lose flesh. They are then moved by rail from the desert to the higher mountains. During this trip they are not fed, and, by the time they reach the end of the journey, large numbers of them develop acidosis. The ewes die, and the lambs, of course, are unborn.

This is a problem of both management and nutrition. Some owners were persuaded to feed corn or other grain on the desert just prior to the trip up the mountains. Ewes so fed were gaining weight when they left the desert. At a transfer point, the ewes were rested and fed. When so handled, they reached the destination without difficulty. A problem which had seemed exceedingly difficult was solved by a simple change in management. This, like all other sheep problems, must be handled on a flock basis, because, economically, an individual sheep is hardly worth treating.

Troubles follow docking and castration. Our sheep men do a poor job of docking and castrating, so that the infections which follow are numerous: tetanus, erysipelas, arthritis caused by diphtheroids, blackleg as a wound infection, and many others. Careless operations should be corrected, and sheep men should get the instructions they need along these lines from veterinarians.

A dietary problem develops when lambs fed in cribs on dried beet pulp become paralyzed. We believe, but are not sure, that this condition is related to the feeding of beet pulp. When the ration is changed the losses stop. Most of the affected lambs respond to the intravenous injection of calcium.

Another dietary problem is the formation of urinary calculi in very young lambs that are still nursing. It occurs primarily in flocks fed rations deficient in vitamin A, and where commercial minerals are fed to excess. Although we have failed to produce urinary calculi by experimentally feeding suckling lambs excessive amounts of these minerals, we still believe that there is a correlation.

Many other comparable conditions could be mentioned. Parasitism is a common condition in young lambs, which can and should be prevented. Primarily, it is a matter of combined management and nutrition, because the heavily parasitized flocks are usually poorly nourished and managed. The most important external parasite is the tick. When present, the parasites move from the ewes to the lambs in large numbers. The resulting loss of flesh and failure to gain could be easily and cheaply avoided by dipping the ewes to rid them of ticks before the lambing season.

Coccidiosis is a serious form of internal parasitism. If lambs are brought from the range and immediately confined in fattening pens, they commonly develop coccidiosis about the eighteenth day. But, if allowed to range over the cropped fields for three weeks and then confined to the pens, the incidence of coccidiosis is greatly reduced. Some feeders do not like to follow this procedure, because they believe that they are wasting time and that the lambs could be fattened more quickly if moved directly from the range to the fattening pens.

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Bighead, or photosensitization, is caused by a variety of plants, of which we recognize some but by no means all. It is more common in white-faced sheep, but occurs also in those with black faces.

Arthritis is common and frequently appears when the weather is cold. The lambs develop a lameness that lasts for about three weeks, and then usually recover. As already mentioned, the diphtheroid organisms are isolated from the affected joints regularly.

Listerellosis was first reported in sheep in Colorado in 1938 and became progressively more common until it is now one of the major problems. Little is known about the prevention and control of the disease, and it deserves a more concerted research study because it has also become a serious cattle problem.

Contagious exanthema, or sore mouth, is common and may be mild or serious. It starts with a papule, vesicle, or pustule, and later forms a scab. The condition can be effectively prevented by vaccination before the disease appears, and it can be controlled satisfactorily by vaccination after it has produced recognizable lesions. The condition is transmissible to man, and causes a lesion that is exceedingly painful and heals slowly.

The bucks or rams develop a venereal disease which is always costly and often serious, because it usually is discovered only when the bucks should be used for service — thus necessitating a search for and purchase of an entirely new set of bucks.

Enterotoxemia, or overeating disease, has been frequently discussed at meetings and in the veterinary journals. It is characterized by large subcutaneous hemorrhages which may be seen upon removal of the hide, and hemorrhages on the heart and the serous surface of the intestine. The kidneys are soft and degenerate rapidly to a pulpy consistency.

Pregnancy disease, or ketosis, rarely occurs in a ewe carrying a single lamb. It is common in ewes carrying twins or triplets, especially if they are fat and are confined to small pens for lambing. Proper management, with adequate provision for exercise, will effectively prevent ketosis.

Icterohematuria is characterized by a rapid destruction of red blood cells and deposit of the pigment in all of the body tissues. The gall bladder is enormously enlarged, the bile dark, the kidneys black, and the spleen much enlarged and filled with a pulp the consistency and color of blackberry jam. The condition is always fatal, often reducing the red blood corpuscles to less than 1 million; it has not been reported in sheep under 1 year of age. It has been suggested that consumption of copper may be a factor in its appearance.

Nicotine poisoning is sometimes seen, especially when an overenthusiastic owner deposits a dose of vermifuge (nicotine sulfate and copper sulfate) in the lungs instead of the rumen.

Founder occasionally occurs in lambs, contrary to the belief that is almost universal among sheep men to the effect that it is impossible to founder lambs. It is caused by self-feeding hungry lambs on a rich grain mixture, but differs from the overfeeding of enterotoxemia.

Diseases of the Foal

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The diseases of the foal may be classified as infectious, parasitic, nutritional, and hereditary. In the equine nursery, disease becomes so intricate that agnosticism seems to be the inevitable sequel to investigation. However, by discussing the diseases of which we know little and passing over those which we can control, all may contribute valuable information.

The disease complex known as pyosepticemia neonatorum includes most bacterial infections of the foal. Williams[1] names intrauterine infection as the cause. Dimock[2] points out that prevention lies in following these principles: (a) breed only mares with a clean, healthy genital tract; (b) service these mares with healthy, fertile stallions; and (c) observe scrupulous cleanliness in the breeding shed. A few cases of postnatal infections will occur and, in order to minimize these, a clean and sanitary environment must be provided for each parturition. Separate foaling barns for mares should be avoided unless the owner is prepared to carry out complete disinfection of the stall after each parturition. Cross infection of mares and foals will follow unless this is done. Foals suffering from infections, and the dams of these foals, should be segregated from the brood mare band until the infection has been overcome.

The umbilicus of the foal should not be tied after birth except under unusual circumstances. Although the disinfection of the stump has been a common practice in well-managed nurseries and serves to impress the caretakers with the idea of sanitation, it is probably unnecessary. In 1939, a prominent veterinary practitioner in Lexington, Ky., recommended that aqueous mercurochrome be substituted for tincture

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of iodine in the disinfection of the umbilical stumps of the foals in all the nurseries under his supervision. He was aware of the inefficiency of the substitute, but believed that the tincture of iodine was causing an unnecessary inflammation in otherwise normal foals. During five foaling seasons at the U.S. Remount Station, Fort Robinson, Neb., the efficiency of disinfecting the stump with an iodine swab, spraying the stump with aqueous mercurochrome, and no disinfection whatsoever was compared with mares and foals under similar circumstances and with little infectious material present. No difference was noted.

Penicillin, transfusions of the blood of the dam, and a sulfonamide constitute adequate treatment of these diseases and the prognosis is more optimistic than formerly. Intrasynovial injection of penicillin in saline solution has merit and is recommended in cases of arthritis, especialy in the hock or stifle.

DIARRHEA

At equine nurseries, foals commonly suffer with diarrhea when about 9 days old. This has been attributed to changes in the milk of the dam during the first estrous period; to inflammation of the udder; to irregular feeding due to the removal of the dam for service; to ingestion of straw, hay, and grain; and to the ingestion of genital discharges of the mare. It is time to eliminate from our text books most of these causes. Diarrhea exists in bottle-fed foals when none of the above conditions are present. There is no unusual change in the milk of the mare during this period. The foals of poor milkers are as susceptible as the foals of good milkers, and inflammations of the udder are not common on or about the tenth day after foaling. The scouring occurs in pasture-bred bands as well as in those bands where the dam is removed for service. The discharges of the mare may affect the type of scouring that occurs.

During the foaling season of 1948, at Fort Robinson, 5 foals were selected for study before birth. As soon as a foal was born, a sample of feces was removed from its rectum. The following day, and each day thereafter for twelve days, a sample of feces was again taken from the rectum. A plate and differential count of all bacteria grown from this material was made daily.* Seven bacterial mediums were used (blood agar, EMB, SS, desoxycholate, bismuth sulfite, Russells, and saccharose). We are aware that 5 foals are not a sufficient premise upon which to build an inductive conclusion; however, there were findings of such a character that they may be indicative. As one would expect, many different kinds of bacteria showed up on the plates. It became impossible to identify every strain. However, most colonies constituting more than 1 per cent of the total were identified. The common colonies were of those bacteria which make up the normal bacterial flora of the genital surfaces of the mare. The foal of one mare, Little Shadow, developed a grey, fetid diarrhea on the tenth day. On the eleventh day, *Proteus vulgaris* was found in the feces in appreciable numbers (not found in any of the others in sufficient numbers to be identified). The mare developed a cervicitis and vaginitis following foaling, and a swab was made from her cervix before treatment was initiated. This swab yielded a pure culture of *P. vulgaris*. Although this was an unusual case, it demonstrated that the genital discharge of the mare influenced the bacterial flora of the foal.

There were two significant results of this work: (1) The samples taken from all the foals at birth were sterile; and (2) the samples taken one day later were so heavily laden with bacteria that it was impossible to count them in 1:100,000 dilutions. It demonstrates the rapidity of the seeding and multiplication of bacteria. In general, coliform bacteria predominated strongly during the first few days of life. Between the fifth and the twelfth day, the streptococci came into ascendency. In those cases where streptococci predominated (over 75% of the colonies) for three days or more (3 cases), diarrhea occurred. In those cases where the dominance was less than three days (2 cases), no diarrhea occurred. We are not in a position to name the streptococci (nonhemolytic strain) as the cause of the diarrhea but suggest that the adjustment of the bacterial flora of the foal's intestinal tract is a normal process and the seeding for this flora are the bacteria found on or around the udder of the mare, which in some cases will be augmented by genital discharges.

Severe diarrhea may be prevented by eliminating the seeding of bacteria known to be pathogenic. Most diarrheas on or about the ninth day of life need no treatment. Salol and bismuth powders (5 and 10 gr.) given each three hours for one day have proved easy to administer and efficacious. Greasing the tail and buttocks will make it much easier to clean the foal and will prevent scalding or blistering. In cases of infectious diarrhea (as distinguished

*The bacteriology for this work was done by Captain Stephen B. Hitchner, V. C., then stationed at the Army Veterinary Research Laboratory, Fort Robinson, Neb.

from this ninth day variety), pectin, kaolin, niacin, and, lately, sulfamethazine have been used with good results.

PARASITES

The treatment and prevention of parasitic infections in foals are well known and the owners are aware of the consequences of these infections. Yet there seems to be no will to put into practice that which is known. It is a "selling job" each year, with the insidious effects of parasitism usually having a hard race against the obvious transient effects of the treatment, such as rough handling, making the foal go off feed for a few days, and the production of anemia. Britton[3] reports a foal with a large verminous aneurism at 75 days old. Such infections can be prevented only by an adequate control plan that assumes that all the animals on the farm are parasitized. A systematic plan of pasture control and vermifuges must be used. The precept of treating only those animals having a high parasite egg count is not sufficient. The animal with a low egg count today may be the spreader of tomorrow. There is little need to be heroic in the treatment, since it matters little how thorough a single dose does its work for there will be other parasites shortly thereafter. Only an extended course of treatment can rid the animal of parasites and then only if it remains free from reinfections.

MALNUTRITION

Dietary deficiencies are mentioned here to introduce the subject for discussion. We are, clinically, groping in the dark on this subject. We know that the occurrence of goiter in foals is not the result of iodine deficiency alone, that rachitis is not the result of imbalance of calcium-phosphorous ratio in the absence of vitamin D alone, and that genital infections in the broodmare have a tendency to increase the occurrence of goiter, and that the feeding of potassium iodide in the ration of the mare will not eliminate the trouble.

Wherever foals are born, they are plagued with crooked legs and contracted tendons. By getting rid of infected mares, this condition can be practically eliminated. However, these mares are apt to be the finest breeding stock and correction must be attempted, although there is no specific treatment for these deformed animals. They make it or they don't according to their own adaptability. Tenotomy has proved a failure in the correction of contracted tendons.

Warkany[4] and associates pointed out that the tissue of the dam protects the fetus, within certain limits, even going to the extreme of resorption of the fetus.

A condition which may or may not be rachitis is prevalent in the Thoroughbred horse breeding centers, even where the calcium-phosphorous ratio and the vitamin D requirements are within the limits of good nutrition as we know them. Very young animals develop splints. Yearlings and 2 year olds "pop" them overnight and, in 1 case, they were noted on a suckling foal. The splints are spontaneous and not the result of use or trauma. Other manifestations are the thickening and nodulation along the ventral surface of the mandible and the swellings on the ends of the long bones around the epiphyses, most commonly around the fetlocks, knees, and hocks. The abnormalities are so common that experienced horsemen in various parts of the country look upon them as perfectly natural. In most cases, the foals survive and usually outgrow the condition. In some cases, as in the young filly mentioned above as having developed splints before she was weaned, they get progressively worse and, although they are born straight and sound, become so deformed that they are worthless.

The more spectacular disease known as "wobblers" (ataxia of Equidae) may be another manifestation of this same complex. The condition was noted at the U. S. Army remount depots at Fort Robinson, Neb., Front Royal, Va., and Fort Reno, Okla., as well as at the Valdina Farm in Texas, stud farms around Sheridan, Wyo., and in all of the large studs in the vicinity of Lexington, Ky. It was found in animals on good pasture and in animals on rations adequately balanced according to our present day knowledge. No explanation nor corrective measure is offered but the condition is merely brought to your serious attention.

IMPROVED NUTRITION

An attempt was made at Fort Robinson, Neb., to improve the diet of the foal, by supplemental feeding of the dams both prenatal and postnatal. For several years, certain mares were fed supplements and others were not. This was in addition to the basic ration of oats, corn, prairie hay, and alfalfa. The supplements used were freshly cracked wheat, wheat germ meal, exadol, sun shark oil, via-D-mineral, and limestone-bone meal mixtures. No appreciable results were noted over an extended period, but certain of the items have been incorporated into our ration as a means of providing a balanced diet, although they were not important *per se* in reducing the occurrence of the symptom complex men-

tioned above (cracked wheat and a limestone-salt-bone meal mixture are now used in the everyday ration of our broodmares).

Warkany *et al.*[4] report that 1/3 of the offspring of female rats, fed a riboflavin deficient diet, will have malformations of the skeleton, soft tissues, or both. Jones *et al.*[5] have reported that riboflavin, added to what used to be considered an adequate diet, prevents periodic ophthalmia.

Perhaps it is time to stop considering these conditions in terms of a negative phase; that is, that the diet has a deficiency or omission of a specific substance. Wooley *et al.*[6] first pointed out the existence of an antivitamin when they showed that 3-acetypyridine was actually poisonous to animals deficient in nicotinic acid, but that animals with an adequate nicotinic acid diet were not affected. Later, pyrithiamin was produced which is antagonistic to thiamin. Thiamin deficiencies were produced in the presence of ample thiamin when pyrithiamin was fed.

Another example of the vitamin-antivitamin process is the use of vitamin K against dicumarol as in sweet clover poisoning of cattle. Along this same trend, the work of Krehl *et al.*[7] suggests that the intestinal bacterial flora might play a significant rôle in the synthesis of toxic substances. They were searching for a theory to explain why diets of corn, which were no lower in nicotinic acid than diets of rice or millet, would produce pellagra when the millet or rice diets would not; yet the addition of nicotinic acid to the diet would alleviate the condition. Later, lysine and tryptophane were implicated in this deficiency.

Perhaps, in this complex of metabolite-amino acid-vitamin-antivitamin association, we will find the answer to some of these problems.

JAUNDICE

Icterus neonatorum, or jaundice of the newborn, is the name associated with a disease affecting the young of a great many animals including the foal. The syndrome has been noted for many years. Sausseau[8] mentioned the disease in 1925, Wakabayashi[9] in 1932. Radeff[10], in 1934, also refers to the earlier writings of Hartmann-Schotter *et al.* An abstract of an article by Blanck[11] was published in 1940. The most recent published work on this subject appeared in June, 1948, by Bruner, Hull, Edwards, and Doll.[12]

Several forms of jaundice appear in foals. They are distinguishable and classified according to their causes. True icterus neonatorum is idiopathic and not the result of infection, nor is it secondary to biliary obstructions. The disease occurs during the first few days of life and is usually fatal within four days. The foal appears normal at birth and is eager to suck. During the first day, after having nursed, the symptoms appear. Usually, the first thing noted is that the udder of the mare is full and that the foal, thought to be so healthy, is no longer nursing. The yellow color in the sclera, the eyelids, and the buccal membranes becomes noticeable. The temperature is normal, the attitude somnolent. As the jaundice increases, the foal becomes so weak it cannot stand and soon will not be able to lift its head from the ground. The temperature may be subnormal. Death occurs soon thereafter. The author observed 1 nonfatal case. The foal was normal when born and soon developed the initial symptoms of icterus neonatorum, inappetence, weakness, somnolence, and jaundice. Without treatment of any kind, the foal remained in that condition for several days, during which it took a little milk and slept most of the time. Its coat was very rough. It soon regained its strength and recovered spontaneously. Another case of icterus neonatorum occurred in a foal suffering from pyoseptecemia neonatorum. The foal was given a transfusion of blood from the dam and promptly died. In this case, the septicemia masked the icterus which went undiagnosed, except as a symptom of the bacterial disease, until the familial characteristics became known. The disease is not known to be hereditary but it is certainly familial.

TABLE I—Foaling History of the Mare Taglioni

Year	Sire of foal	Foal
1942	Flage Pole	colt, normal
1943	(not bred)	...
1944	Cherry King II	filly, normal
1945	Cherry King II	filly, fatal ict. neo.*
1946	Chimney Sweep	filly, normal
1947	(barren)	...
1948	Flag Pole	filly, severe ict. neo. which responded to treatment

*ict. neo. = icterus neonatorum.

Icterus neonatorum occurred in the second foal of the same horse in each case. At least one horse (Flag Pole) is known to have blood cells which were agglutinated by the serum from Taglioni. The mare, Merry, produced foals which developed icterus neonatorum. One of her unaffected daughters, Sweet Charity, produced a foal, from the first mating of a stallion, which died of icterus neonatorum (no previous foals by the same horse). Although neither Merry nor Sweet Charity were available, another daughter of Merry was bled and her blood typed. This mare is believed to have produced a case of icterus

neonatorum, but as she was sold there is no record of the foal available. At any rate, this mare, called Fitzmerry, matched the blood of Taglioni. The serum of Fitzmerry and Taglioni completely agglutinated the cells of Flag Pole and 3 of his daughters.

TABLE 2—Agglutination Tests

		Cells					
		A	B	C	D	E	F
Serum	A	0	xxxx	xxxx	xxxx	xxxx	xxxx
	B	xx	0	0	0	0	0
	C	0	0	0	0	0	0
	D	0	0	0	0	0	0
	E	0	0	0	0	0	0
	F	0	0	0	0	0	0
	G	0	xxx	xxxx	xxxx	xxxx	xxxx

A = Taglioni, B = Taglioni-Flag Pole filly, C = Flag Pole, D = Flajelda, E = Star Belle, F = Princess Flag, G = Fitzmerry.

The blood of the foal (B) did not match either the sire or the dam at the time the bleeding took place, which was three weeks after multiple transfusions had been given. It matched more closely the blood of the sire. However, this brings out the possibility of this foal acquiring agglutinins from the dam rather than inheriting them directly.

Bruner, Hull, Edwards, and Doll[12] state that no complete agreement has been found in their reactions of the blood of mares thought to have the i.n. (icterus neonatorum) factor and those not carrying this factor. They suggest that other tests must be devised before it will be possible to detect susceptible mares or stallions. Their investigations showed that the serum from the dams of infected foals caused the cells of the foal as well as of the sire of the foal to agglutinate. Thus far, there has been no report on the reaction of the blood of normal foals born of mares and stallions which subsequently produced icteric foals.

Since the disease is similar in some respects to erythroblastosis fetalis of the human being, these aspects will be mentioned. Darrow[13] pointed out the familial aspects of erythroblastosis fetalis and explained it by an unsubstantiated antigen-antibody reaction. In 1940, Landsteiner and Weiner[14] discovered such a factor, which they called Rh, in the blood of the human infant. These same workers showed that the factor was inherited as a simple Mendelian dominant. Witebsky[15] found the Rh factor in human milk and assumed it could be acquired by nursing young. The disease in the infant is characterized by icterus, anemia, somnolence, muscular twitching, convulsions, opisthotony, etc.

Bruner[12] and associates have shown that the Rh factor is not involved in the equine disease. According to Hutyra, Marek, and Manninger, isoagglutinins which pass through in the colostrum were implicated by Lenart, Moussu, and others as the causative agent in icterus neonatorum in calves. In addition to the marked jaundice in affected foals, Bruner[12] and associates report an erythrocyte count from 2,000,000 to 3,000,000 per cubic millimeter.

Treatment of the disease is transfusion of blood of the proper type—that is from donors whose blood matches that of the foal. Present information suggests that the sire may be a better donor than the dam. These transfusions must be given frequently (at least every 3 hours, and oftener if the foal becomes worse) and in amount upward of 300 cc. at a time. If the foal will not suck, it must be force-fed, preferably with milk from sources other than its dam. Blanck[11] reported recoveries after intramuscular injections of 40 mg. of thiamin. Vitamin K was recommended by Leonard[16] to be given to the donor of a transfusion before the blood is withdrawn. Theoretically, the disease may be prevented by keeping the foal from sucking its mother. It is also possible to prevent it by breeding animals having the proper genetic blood groups, but, as mentioned above, the tests for this grouping are not yet accurate enough for application.

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Histamine and Its Synthetic Antidotes

The antidotes of histamine—antihistaminics—which have come into prominence in recent years are outstanding contributions of chemotherapy to the sum of physiopathologic knowledge. The antidotes have been the means of exposing the intricate behavior of the toxic agent—toxic when the amount present surpasses the physiologic norm.

Although discovered fifty years ago, histamine (imidazol-ethyl-amine) was not immediately known to be involved in the genesis of pathologic states. Later, combing for facts about its multiple rôles took on the character of a veritable witch hunt. Much remains to be learned about its stealthy ways in our branch of medicine.

The source of histamine is the *alpha* amino acid, histidine, a product of protein fragmentation. Histamine is readily soluble in water, alcohol, and acids, so that it is easily extracted for investigation. The records show that it was first isolated in the gonads of the sturgeon (1896) and in ergot of rye (1910), but it has since been recognized as an ingredient of the blood and solid tissues of birds, fish, mammals, and plants.

Histamine is of both exogenous and endogenous origin; that is to say, (1) it may be ingested already formed or be produced by bacterial action in the process of intestinal digestion, or (2) it may be synthesized in the tissues beyond the level of the digestive tract. In both instances, it serves or injures according to concentration. The action of *Escherichia coli* has been charged with being responsible for the dermatosis clinically expressed as founder in horses and cattle, and paratyphoid A is held accountable for equine pulmonary edema—but without well-proved conclusions.

Although the symptoms of "hyperhistaminosis" have yet to be assembled into clinical syndromes, those following histamine injection in experimental animals are similar to those in naturally occurring attacks of allergy or anaphylaxis. The animal maladies in which histamine is thought to participate make up a long list of dissimilar pathologic entities. Some of these conditions and their treatments are discussed in the article by Rawson in this issue, and others are listed in his bibliography.

The wide range of morbid states shows that aberrant histamine is not easily pictured for clinical guidance in veterinary medicine, but it indicates that resort to antihistaminic therapy is justifiable inasmuch as its use will serve as a means of clarifying the physiopathology of histamine in the group of animals to which we render medical service.

THE ANTIHISTAMINICS

Antihistaminics are not chemical antidotes; their action is uniquely physiologic. They do not suppress the formation of histamine or its precursor, histidine, in the digestive tract. Nor do they diminish the quantity of histamine in the blood or tissular cells. On the contrary, they may actually increase its presence. They nullify the harmful action of histamine at the level of the cells, and thereby aid the resolution of pathologic processes. It is, therefore, obvious that the sum of knowledge about the therapeutics of antihistaminics is best enriched by observing what they do to the ailing subjects. The different species of animals treated, the different structures of the body affected, and the degrees of reaction produced are but clinical observations of the medicinal value of these substances. As physicians have done (mainly through observation), veterinarians must compute the value of these agents by measuring the results obtained. The mechanism of their action at the level of the cells would be as difficult to explain as the antagonism of chloral and strychnine.

Available through the drug trade are the American products, benadryl (3-dimethyl-amino-ethyl-benzhydril ether hydrochloride) and pyribenzamine (N pyridril-N benzyl-N dimethyl-ethyl-diamine),* and described as to their uses in the "Report of the Council on Pharmacy and Chemistry" (*J. Am. M. A.*, Nov. 23, 1948).

Swiss pharmacologists have produced antistine (N phenyl-N benzyl-amino-imidazoline) which has not gained prominence in the veterinary circle.

From France comes antergan (N dimethyaminoethyl N benzylaniline) and neoantergan (N p-methoxybenzyl N dimethyl-aminoethyl Z aminopridine), about which considerable has been written as to their trials in dogs and in horses suffering from periodic ophthalmia, anasarca, and summer eczema.

Phenothiazine, popular anthelmintic in cattle and sheep, is said to possess important antihistaminic properties.

*First advertised in American veterinary journals by Goshen Laboratories, Inc., March, 1949.

The veterinary profession has been developed in the interests of the livestock industry and of public health.

Anaplasmosis Treatment with Paludrine — A Case Report

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THE TREATMENT of acute anaplasmosis involves two basic phases of therapy: direct action against the Anaplasma, and repair of the blood damage done by the parasite. We have directed our attention toward finding a drug with specific action on the Anaplasma organism. In this work, drugs effective against protozoan diseases (quinine, atabrine, stilbamidine, and others) have failed to demonstrate anaplasmacidal properties. The work has continued, however, and tests with "paludrine" (one of the new synthetic, antimalarial drugs) have just been concluded.

Splenectomized calves were used in these studies, each calf being infected with 1 cc. of carrier blood in which 0.5 per cent of the erythrocytes contained Anaplasma organisms. Each calf was infected from a separate source of carrier blood. Erythrocyte counts were made using the improved Neubauer hemocytometer, hemoglobin values were determined with the Haden-Hauser clinical hemoglobinometer, hematocrit values were determined by Wintrobe's method, blood films were examined, and paludrine concentrations in the blood plasma were determined by the Christ Hospital hydrolysis method with readings on the Klett-Summerson photoelectric colorimeter.

Although paludrine is only slightly soluble in cold water, it was possible to prepare a 1 per cent solution in hot, sterile, distilled water. This was injected intravenously with a gravity flow Simplex outfit and was never used when more than one day old. Because even small quantities of this drug are irritant in the subcutaneous tissues, special care was used to deposit all of it within the jugular vein.

Case 1.—In the first test, Anaplasma bodies were found in the blood sixteen days after experimental infection. The rise in Anaplasma infection continued at a normal rate, and when 8.4 per cent of the erythrocytes contained Anaplasma bodies treatment was begun. Paludrine was administered intravenously at the rate of 10 mg./kg./day in equal doses at twelve-hour intervals. This was reduced on the fourth day to 6 mg./kg./day for two more days.

During the course of treatment, the rise in Anaplasma infection was suppressed, and the number of infected erythrocytes remained at approximately 15 per cent for five days. Two days after discontinuing therapy, the Anaplasma rapidly increased to the peak (30%). The peak of infection in this particular case was reached in nineteen days as compared to eleven days required in the average case of anaplasmosis. The clinical condition of the calf had improved by the end of the period of treatment.

Case 2.—In the next test, Anaplasma appeared in the blood twenty-two days after infection. Seven days later, when 1.5 per cent of the erythrocytes were infected, treatment was begun. The drug was injected intravenously at the rate of 20 mg./kg./day in four equal doses at six-hour intervals. This dosage proved toxic and provoked symptoms of abdominal pain. It was reduced to 15 mg./kg./day divided into three doses at eight hour intervals, for one day and then increased to 17 mg. and 18 mg. on successive days. At this time, dosage was again reduced to 15 mg. but supplemented by oral administration at the rate of 33 mg./kg./day divided into three equal doses at eight-hour intervals.

The peak of infection was reached on this day, but treatment was continued an additional day (12 mg./kg. intravenously and 31 mg./kg. orally) and then discontinued. The rise in Anaplasma infection covered a period of twelve days and progressed at a normal rate during the period of treatment. Vacuole-like abnormalities occurred in many of the Anaplasma bodies in this case, but their presence is not believed to be connected with the treatment.

Case 3.—In this experiment, Anaplasma again appeared in the blood after twenty-two days. Treatment was begun five days later when the infection had increased to 1.6 per cent. The initial course of therapy consisted of intravenous injections of paludrine at the rate of 10 mg./kg./day and oral administration at the rate of 40 mg./kg./day. Half the daily dose was given by each method in the morning and the remainder twelve hours later. Subsequently, oral doses alone were used at the above rate and interval.

The rise in Anaplasma infection continued at a normal rate, despite the paludrine blood plasma levels which were nearly five times those obtained in the initial experi-

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ment. Symptoms of overdosage were seen on the second day, but therapy was continued at the same high level. The early symptoms were dyspnea, albuminuria, and anorexia. Tremors and twisting of the head, with muscular spasms, developed a few hours before death.

Gross postmortem changes were ecchymotic hemorrhages on the myocardium, catarrhal enteritis, and yellowish green liver with areas of necrosis. Microscopic examination of the liver disclosed fatty degeneration, cloudy swelling, and areas of coagulation necrosis.

In an additional experiment, a susceptible calf was given paludrine orally for three days at the rate of 20 mg./kg. An inoculating dose of 1 cc. of blood in which 0.5 per cent of the erythrocytes were infected with Anaplasma was then administered. Dosage was continued for five additional days at the rate of 5 mg./kg./day. Acute anaplasmosis developed with no evidence to suggest any prophylactic value from the drug.

CONCLUSIONS

Paludrine appeared to produce Anaplasma suppression in 1 animal, but the action could not be reproduced in 2 additional cases even at fatal plasma levels. The drug showed no evidence of prophylactic value.

The results, as a whole, fail to substantiate the report from the Oklahoma Veterinary Research Institute that paludrine is effective in acute anaplasmosis.

We believe that transfusions of whole blood remain the most effective treatment, but they have not been widely used because excessive time and effort is required to make the transfusions. Other treatments (sodium cacodylate, Fowler's solution) apparently have little or no effect on the course of anaplasmosis.

Chick Output Greatly Increased

The 80,899,000 chicks produced during January, 1949, represents a 54 per cent increase over January, 1948, the Bureau of Agricultural Economics reports. This is also the highest production on record and constitutes an increase of 48 per cent over the 1943-1947 average. The number of eggs in incubators on Feb. 1, 1949, was 32 per cent higher than on the same date a year ago. On February 1, the number of chicks booked for March delivery was 59 per cent larger than on that date last year. This increase is attributed to the favorable feed:egg and feed:chicken ratio.—*From Feedstuffs, Feb. 26, 1949.*

—*Acme Photo*

Cattle on a farm near Chesterfield, Mo., neck deep in flood water from the Missouri river, which went over its banks after heavy rains, flooding much farm land in Missouri and Iowa.

Erysipelas in Turkeys — A Case Report

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ON OCT. 28, 1946, a county agricultural agent in the upper peninsula of Michigan wired the diagnostic laboratory that he was sending a turkey which had died of an acute infection. A flock of more than 400 turkeys of nearly market age and condition was at first reported to be involved. The following afternoon, a mature Broad Breasted Bronze male turkey was received at the Michigan State College poultry clinic. The bird, shipped approximately 500 miles, arrived in good condition as it had been sharp frozen and properly packed. Examination showed some congestion of the pectoral muscles and those of the medial aspect of the thigh, an excess of mucus in the oral cavity, suffusive hemorrhages in the heart fat, acute congestion of the liver, and flaccid intestines. Some mucosal congestion of the duodenum was present. The caruncle was not swollen. Examination of thick blood smears stained with Wright's stain showed many short, thin, delicate rods. A pure culture of *Erysipelothrix rhusiopathiae* was obtained on blood agar Petri plates from heart blood and liver.

On October 31, the owner was advised to isolate, immediately, all sick birds and have each given two intraperitoneal injections of 30,000 units of penicillin, three to four hours apart. All turkeys were to be fed only mash containing sulfamerazine (0.75%) for one week. This was to be followed by oats and nonmedicated mash, but corn and/or wheat were to be fed sparingly. It was recommended that all healthy birds be marketed as soon as possible and subject to meat inspection. The owner was cautioned that the disease is infectious for man. A questionnaire, calculated to supply more informaton about the outbreak, was sent. The reply was received in two parts —six and ten months later!

Additional history revealed that there were 1,450 turkeys on the farm. There were no sheep or hogs on the premises nor had there been any exposure to other poultry or to poultry dealers. However, corn had been purchased in used feed bags. For twelve weeks preceding the outbreak, 468 turkeys had been held on a clover sod range. There had been a good sod cover originally, but the fall rains and snow had formed many mud puddles in the heavy clay soil. The remaining turkeys were held in sun porches as follows: porch A, 351; porch B, 195; porch C, 436. About October 20, the range birds were put on an all corn diet. A few days later, 36 birds were found dead in the roosting quarters. The next day, 15 died, and then about 10 daily for the following three or four days. It was not possible to cull affected birds because the course of the disease in individual birds was too short. The corn diet was replaced with oats and mash containing sulfanilamide, this being the only sulfonamide which the local veterinarian had on hand. No penicillin was used. The birds, it was reported, "filled up on oats and ate little or no mash." Coincidentally, the range flock was moved to new range. However, in these range birds, the losses continued unabated.

During this time, the birds on the sun porches had been fed corn sparingly. The corn allowance for those on porch A was increased, and they began to die soon thereafter. None of these was examined at the laboratory, but, inasmuch as some showed "swollen heads," it is presumed that this pen, too, had erysipelas.

When the disease broke out in porch A, the birds died at a rate of about 10 to 15 per day. The healthy appearing birds in this porch were killed, therefore, as rapidly as possible. Unfortunately, no meat inspection was available for any of the birds slaughtered. A good many turkeys died in porch B also. However, in porch C, where grain was fed sparingly until the owner was forced to turn them on range in November, only 2 birds died.

In November, the range where the disease first appeared was frozen and covered with snow. Because of injuries incurred on the wire sun porches, it was necessary to turn the rest of the turkeys out on range. It was intended to fatten these for the Christmas market, but when losses continued at about 15 per day, the owner proceeded with slaughtering as rapidly as possible. Altogether, more than 400 turkeys of marketable age (more than 35% of the flock) died during the period of infection in this flock.

One of the caretakers was reported to have had a "break" in a thumb which required a physician's attention during the course of the disease in the flock, but it is not known that this was an Erysipelothrix infection.

From the School of Veterinary Medicine, Michigan State College, East Lansing; Dr. Bivins is now with the New Jersey Agricultural Experiment Station, New Brunswick.

In the case here reported, losses in each pen seemed to begin only after heavy corn diets were fed. Did the corn serve to introduce the infection or merely to allow the expression of a latent infection?

Since the acquisition of satisfactory regulatory measures for this disease probably will depend upon documenting its potential danger to human health, a few remarks concerning a case which was presented on Oct. 11, 1945, seem appropriate. The subject, a 6-month-old male Bronze turkey, was delivered from a farmer in Lake City, Mich., with the meager history that a few males had been dying during the preceding two months. The bird showed catarrhal enteritis, hypostatic pneumonia, a few hemorrhages in the spleen, focal necrosis in the pancreas, and urate deposits in the kidneys. A blood smear stained with Wright's stain showed small delicate rods. Cultures from the liver and heart blood on whole blood agar yielded a pure culture of *Erysipelothrix rhusiopathiae.*

The autopsy was performed in the morning and, in the process, the examiner pricked the skin of the medial aspect of his thumb on the cut end of one of the bird's ribs. The hands were washed but not disinfected. By mid-afternoon, a slightly sensitive red spot was present. By late afternoon, some swelling had occurred. Finally, by 10 p.m., a red streak to the armpit, marking the course of the lymph vessel, was visible. There was some pain in moving the arm. The mental condition was confused. An ice pack was placed in the armpit, and the hand was wrapped in a cloth soaked in strong salt solution. The following morning, after examination by the college physician, the examiner was hospitalized for twenty-four hours, during which time 20,000 units of penicillin and 15 Gm. of sulfadiazine were given every four hours. At the end of the 24-hour period, the temperature was normal, swelling and redness of the affected part had disappeared, and the patient was discharged to "go back to work." However, within forty-eight hours after discharge, the redness and swelling returned. This time, hospitalization was effected for sixty hours, during which time drug treatment was continued as before.

The patient was then discharged with instruction to report for penicillin injections every four hours during office hours. This time, an uneventful recovery resulted.

No culture was obtained, so it is not definitely known that the cause of the thumb infection was Erysipelothrix, but this seems most likely.

Commercial Broiler Production

Five essentials of commercial broiler production are: (1) floor plan brooding; (2) an all-in, all-out system; (3) sufficient volume; (4) satisfactory equipment; (5) production of a superior product. The all-in, all-out system puts a number of birds in the brooder at one time, and they are all sold at one time. This leaves a period between broods to thoroughly clean and sanify houses and equipment.

Percentages of costs of producing broilers are: buildings and equipment, 4.2; fuel, 2.6; sanitation, 1.3; litter, 0.3; chicks, 18.6; feed, 61.4; labor, 11.6. Grouping these together, the chicks represent almost 20 per cent of the total cost; feed and labor almost 70 per cent.

The effect of mortality in the cost of producing broilers is: A mortality of less than 5 per cent results in a profit of 6.2 cents per pound; a 5 to 10 per cent mortality makes possible a profit of 5.9 cents per pound; and a 25 per cent mortality reduces the profit to 0.4 cents per pound. The average mortality in broiler production in the United States is from 12 to 14 per cent.

Equipment necessary for satisfactory broiler production must allow from 2/3 to 1 sq. ft. of floor space per chick. There should be at least 1 sq. ft. of window space to each 10 to 15 sq. ft. of floor space. Chicks up to 3 weeks of age should have 1 in. of feeder space per bird; from 3 to 6 weeks old, 2 in. feeder space per chick; from 6 weeks to marketing age, 3 in. of feeder space per bird.

The watering equipment necessary for chicks up to 3 weeks of age is two 1-gal. waterers for each 100; from 3 to 6 weeks of age, one 3-gal. waterer for each 100; from 6 weeks to marketing age, two 3-gal. waterers for each 100. Clean, fresh water is essential for adequate, satisfactory, profitable broiler production. One brooder stove is necessary for each 350 to 500 chicks.—*From the address by MacNorth, of the Ralston-Purina Company, at the Fact-Finding Conference of the Institute of American Poultry Industries, Feb.* 7, 1949.

Avian tuberculosis frequently fails to cause visible lesions in cattle but does sensitize them. This may explain a number of no visible lesion (NVL) cases.

Brucellosis vaccination can still be dangerous when used injudiciously; but it is usually less so than natural infection.—*R. R. Birch, New York.*

Avian Tuberculin Testing in Iowa — 1946-1948

C. D. LEE, D.V.M.
Ames, Iowa

THE GENERAL purpose of this testing survey was to determine the avian tuberculosis present in Iowa poultry and swine. It has demonstrated the effectiveness of the "all-pullet laying flock" as a method of reducing tuberculosis in poultry. It has further shown that a reduction of tuberculosis in poultry will be reflected in the reduction of the disease in swine, as 95 per cent of the tuberculosis in hogs is caused by the avian organism.

The results of the survey show a striking difference in the incidence of tuberculosis in all-pullet laying flocks as compared to mixed and old hen flocks. The incidence in all-pullet flocks was 0.26 per cent, compared to 5.73 per cent in mixed flocks, and 10.42 per cent in old hen flocks. Results also reveal that in mixed flocks (flocks of pullets and old hens) only 0.30 per cent of the pullets were infected compared to 19.89 per cent of the old birds. The farm infection in all-pullet flocks was 12.50 per cent while it was 63.27 per cent in mixed flocks.

TABLE 1—Incidence of Tuberculosis in Iowa Chickens

	No. Flocks	No. Birds	Positive Birds (No.)	Positive Birds (%)	Positive (Flocks)	Positive (%)
All-Pullet Flocks*	152	30,164	79	0.26	19	12.50
Mixed Flocks*	226	51,268	2940	5.73	143	62.27
Old Hen Flocks**	40	4,183	436	10.42	24	60.00
All Birds	418	85,615	3395	3.96	187	44.73

*Ten counties. **Three counties—birds over 2 years old.

That the disease is important to hog producers is shown by the following figures. Of the 45,073,370 hogs slaughtered under federal inspection during 1947, 3,843,732 (8.5%) had tuberculosis. In Iowa, 6.62 per cent of the hogs slaughtered during 1948, exclusive of Sioux City, were infected, while 6.13 per cent slaughtered at Sioux City had tuberculosis. This is a reduction, since 1941, from 11.77 and 9.52 per cent respectively. Much of this reduction can be credited to the farmers in Iowa, who adopted the all-pullet laying flock system.

Eradication of avian tuberculosis can be accomplished by following a few simple recommendations. These recommendations will also reduce losses from other infectious and parasitic diseases. They are:

1) Kill and burn birds that show possible symptoms of tuberculosis such as faded combs, wattles, shanks, and beaks, dull eyes, loss of appetite, decreased activity, wasting away or going light, lameness, and extreme loss of flesh. Flocks should be culled daily.

2) Brood all young chicks in clean, previously disinfected houses far enough away from old birds to avoid contact with them or their droppings. Have a pair of overshoes for use in the brooder house and leave them there.

3) Remove as soon as possible birds to range far enough away from old birds so that they have no contact with material from them. Provide summer shelters.

4) Sell all old birds at the end of their profitable production period. Clean and disinfect the laying house and all equipment. Spray again with a good disinfectant before birds are placed in the house. Spray the base of the house with a solution which will eradicate mites. Keep the house in good repair. Keep sparrows out. They can carry mites to chickens.

5) House pullets in early October and keep them housed until they are sold.

6) Rotate hog lots and yards.

7) Cultivate poultry yards whenever necessary and preferably seed them down.

The adoption of the all-pullet laying flock will be more profitable for the producer because: (1) Pullets are freer of tuberculosis and are less apt to carry other

TABLE 2—Hogs and Sheep Reacting to Avian Tuberculin Test

	No. Herds	No. Anim.	Reactors (No.)	Reactors (%)	% Herds Infected
Brood Sows and Gilts*	66	1884	65	3.45	21.21
Sheep**	..	115	2	1.70	....

*Three counties. **One county.

This is a summary of the avian tuberculin testing project in Iowa. Those coöperating in the program were the U. S. Bureau of Animal Industry, the Iowa Department of Agriculture and Bureau of Animal Industry, the Iowa Swine Producers Association, the Iowa Poultry Improvement Association, and Iowa State College Veterinary Extension Service.

diseases; (2) pullets will lay from 20 to 30 per cent more eggs during their first production year than their second; (3) it takes almost as much feed to carry a hen through the molting period as it does to raise a pullet to production age; (4) prevents loss due to avian tuberculosis in swine.

The survey information reveals that about 40 per cent of the birds in the counties were old hens. It also revealed a high mortality in laying flocks.

Other information gathered by the survey indicates a high mortality in chicks under 12 weeks of age. The majority of these losses was from poor brooding practices, poor feeding methods, over-crowding, coccidiosis, pullorum disease, infectious bronchitis, Newcastle disease, and unknown causes. Most of this loss could be avoided by the following practices:

1) Avoid over-crowding. Each chick should have ½ sq. ft. of floor space.

2) Better management including the brooder stove, better feeding, better sanitation, better housing, and raising chicks on range away from old birds and lots.

3) Early diagnosis of disease by a veterinarian.

4) Pullorum disease control by blood-testing and sanitation.

5) Buying chicks from local hatcheries under a pullorum control program.

6) Control of coccidiosis by good sanitation, ventilation, and the use of deep litter.

7) Avoid contact of young birds with old birds which may be carriers of diseases such as fowl cholera, fowl typhoid, infectious colds, coryza, and other respiratory diseases, fowl pox, laryngotracheitis, Newcastle disease, parasitic diseases, and other infectious diseases.

TABLE 3—Breakdown of Infection in Mixed Flocks

	No. Flocks	No. Pullets	No. Pos. Pullets	Pos. Pullets (%)	No. Old Birds	No. Pos. Old Birds	Pos. Old Birds (%)
Totals for 6 counties.....	128	20,005	62	0.30	10,823	2,151	19.87

White Heifer Disease

This is a hereditary disease characterized by a modified anatomical condition of one or more parts of the generative organs, with a consequent alteration in the physiology of the parts. Descriptions of the condition probably include a number of abnormalities.

It may be classified broadly as a gross genital defect found most commonly among three classes of white heifers, and the differential diagnosis is made by rectal palpation and vulval exploration.

Group A is characterized by hymeneal constriction, absence of the anterior vagina, cervix, and uterine body; a cystic distention of the uterine cornua; presence of well marked mesonephric bodies, and occasionally submucous vaginal channels. There are no symptoms, and when the diagnosis has been made the prognosis is hopeless.

Group B is characterized by uterus unicornis, the abnormal horn being present as a flat muscular band with a cystic formation near the apex. A hymeneal constriction may or may not be present. Treatment consists of perforation of the hymen, relief of any straining, and fattening for slaughter.

Group C is characterized essentially by a hymeneal constriction, the rest of the genitalia being comparatively normally developed. If the constriction is complete, gross utero-vaginal distention results. The prognosis is very poor or hopeless.—*D. N. Spriggs: Vet. Rec., 58, (Sept. 14, 1946): 37.*

Rabies Vaccination in Cats

Because cats are known to be highly susceptible to phenol, it has been argued that use of phenolized rabies vaccine was contraindicated in the feline species. However, a report (*Rev. Méd. Vét., 37,* 1942: 191) from the Municipal Animal Shelter in Lisbon, Portugal, indicates that such is not the case. When 10 cats were injected with the usual subcutaneous dose of 5 cc., and 5 cats with 10 cc., the results were: 13 were alive and well after fifteen days, 1 ran away, and 1 died suddenly on the fifteenth day.

In Portugal, cats, especially the roving type, are considered second only to dogs as transmitters of rabies, while wolves and other wild animals are only accidental transmitters of the disease.

Asthma and sensitization often are caused or accompanied by adrenal dysfunction and thyroid hyperfunction.

Panel Discussion on Large Animal Hospital Practice

At the San Francisco Session of the Association, the Section on General Practice conducted a panel discussion on Large Animal Hospital Practice. The members of the panel were Dr. E. J. Frick, Manhattan, Kan., moderator; Dr. C. Harvey Smith, Crown Point, Ind.; Dr. A. E. Erickson, Charlotte, Mich.; Dr. H. E. Clarke, Petaluma, Calif.; and Dr. W. M. Coffee, LaCenter, Ky. The following is a condensation of the remarks of the panel members and of their discussion of questions asked from the floor of the meeting.

Moderator E. J. Frick (Manhattan, Kan.).—Veterinary hospital practice is changing. In 1918, when I graduated and came to the Middlewest there were practically no small animal hospitals in this area. There were a few on the east and west coasts but none in between. The veterinary profession, during the thirty intervening years, has made more worthwhile, fundamental, economic, and scientific changes than any other profession. The change from a three-year to a six-year curriculum is one important factor in these changes.

Great as these changes have been, it is important that we keep our minds open for similar or greater changes still to come. There is an acute, if not a serious, shortage of veterinarians, and the average age of the practicing veterinarian in the United States is over 50 years. Most practitioners have been overworking, but it has still been impossible to completely or adequately render the veterinary service needed and demanded.

Human nature being what it is, a few practitioners have decided that financial success warrants a degree of independence, a selection of the services which will be rendered, and rejection of other requests. Some practitioners are even arrogant in dealing with clients and prospective clients. When a demand for service exists, and the demand is not met by the person professionally trained to render that service most effectively, the service will be rendered by someone else, even though the demand is not met efficiently.

What does the future hold? The use of the automobile has enabled the practicing veterinarian to minister to a larger number of patients over a wider territory than was possible with a horse and buggy. But even with this increased range of service, an unfulfilled demand for service continues.

The large animal clinic and hospital is coming back, because it provides a greater opportunity to use professional training and skill. Instead of requiring almost endless driving by the professional man, it puts the driving burden on the livestock owner and conserves the time and energy of the veterinarian.

The large animal clinic and hospital has advantages and disadvantages. The advantages seem to outweigh the disadvantages. Some favorable points are:

The patient gets better care, because it can be examined at frequent intervals, changes can be observed promptly, medication can be administered advantageously, and the general care by a skilled attendant will be superior to farm care.

The cost to the owner will be less. Because of the expense of repeated calls at the farm, medication is often administered so seldom and at intervals of such length that recovery is not at an optimum rate.

It saves time for the veterinarian. This saving permits the treatment of many more animals. In our clinic, we have treated as many as 100 cases in a single day, an impossible feat if each animal were located on a separate farm.

It permits the veterinarian to retain and improve his professional skills. The time otherwise spent in driving is devoted to performing surgical operations and treatments.

It eases veterinary practice, because the instruments and facilities are always at hand to perform each operation to the best advantage and with a minimum of physical effort. Assistants can be trained and used to maximum advantage.

It permits regular postmortem examination of dead patients while the carcasses are still fresh and while lesions can be recognized and correctly evaluated.

It permits the use of laboratory tests which would seldom be used on a farm call, *i. e.*, blood film, tuberculin, agglutination, ketosis, fecal, urine, and other tests and examinations which may seem unnecesary or unimportant at the first call, but which are indicated by later changes in the animal.

It provides clients with an ever-present consultation service. Availability of such service encourages early reporting of abnormal or unusual conditions observed by livestock owners.

It assists in more effective dispensing of medicines, because the diagnosis of the owner can be interpreted by the veterinarian before medication is purchased and administered.

It saves time for the animal owner. One sick animal separated from the remainder of

the herd requires much time and attention. This is rendered at the expense of the healthy animals, or not at all.

The disadvantages of the large animal clinic are:

It entails extra work around the office—the feeding, care, and attention to the hospital pen or ward.

It increases the expense, by necessitating purchase of feed. This is readily offset by charging the feed to the animal owner.

It introduces infections. True, but it introduces them to a place that can be readily and thoroughly disinfected.

It increases the overhead: cost of building, additional help, etc. This factor can be eliminated or turned to a definite advantage if two or more veterinarians work together. In that event, one building, one office secretary, one telephone, and one stock of pharmaceutical and biological products supplies the needs of two, three, or even four veterinarians.

We have a few specific questions to ask of the panel members. Dr. Smith, do you think you could render better veterinary service to large animal owners by hospitalizing their patients?

Dr. C. Harvey Smith (Crown Point, Ind.).—No. During twelve of my thirty-nine years of practice, I had a hospital, but I am convinced that my field surgery is as good as my hospital surgery. Good field surgery comes only after a thorough mastery of anesthesia and restraint—and, of course, proper surgical technique. Careful field surgery eliminates the need for aftercare, or reduces it so that the owner can provide the aftercare.

It is just as easy to prepare and carry surgical instruments to the field as it is to transport the patient to and from the hospital. Such transportation is a needless expense to the owner and sometimes a detriment to the animal.

Ten veterinarians in various parts of Indiana were recently asked this same question. Eight answered "yes" and two answered "no." My own reply is, therefore, in the nature of a minority report. These same practitioners were then asked, "Would building and maintaining a large animal hospital be a good business venture, and would the added returns justify such a

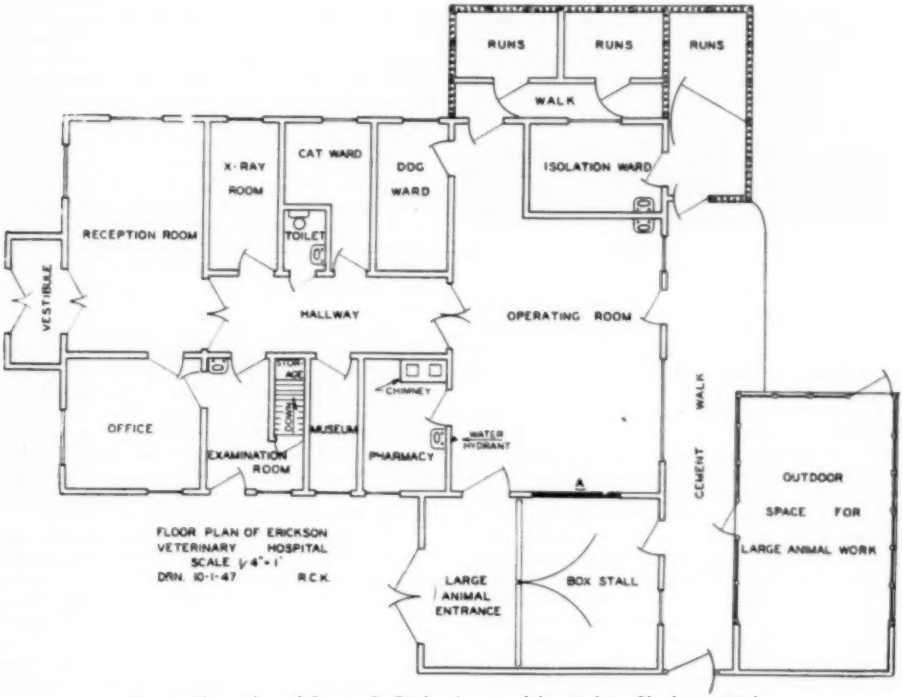

Fig. 1—Floor plan of Dr. A. E. Erickson's animal hospital in Charlotte, Mich.

venture?" Nine said "no" and one said "yes."

Moderator Frick.—In Kansas, every farmer has either a truck or a trailer, so transportation is not considered an item of expense.

Do you agree with Dr. Smith?

Dr. A. E. Erickson (Charlotte, Mich.).—We believe that our hospital, located just inside the city limits (pop. 5,500), enables us to render a better service to more livestock owners than would be possible without its facilities. Our hospital operates chiefly as a clinic; we actually hospitalize very few animals.

The average veterinarian is poorly housed and does his housekeeping poorly. Beginners select their hospitals on a basis of funds available, but many of us who are financially able have failed to develop a consciousness of the definite need to house ourselves better and to keep our houses in better condition, and thus be a credit to the profession. Very few large animal hospitals have been built with that purpose in mind.

The veterinary hospital should be located at some distance from other buildings; it should be conspicuous and attractive in appearance; it should be set back from the highway to afford easy visibility of the entire plant; and it should be surrounded by spacious lawns that are well kept.

Fig. 2—Exterior of Dr. A. E. Erickson's animal hospital in Charlotte, Mich.

Our hospital is constructed of cinder blocks painted white, with window sills of red brick, and awnings of plain blue. A wide, circular drive provides easy ingress and egress, as well as ample parking space. The building is 32 ft. wide and 52 ft. long, with an L 14 by 21 ft., which serves as a box stall or a garage. Figures 1 and 2 show the floor plan and the arrangement and appearance. The museum contains some 150 pictures of diseased animals taken in this practice and about 100 specimens also collected at the hospital. A small basement houses heating and ventilating equipment.

Although it is located in an area well supplied with veterinarians, the hospital is busy enough to keep two veterinarians and two women busy full time, with a handy man about half time. Clients have learned that service is always available, so that animals can be brought to the hospital for prompt treatment.

We believe that our hospital is respected in the community, that it is a sightly addition and a credit to the profession; and we find it a pleasant headquarters from which to practice.

Moderator Frick.—This is an excellent example of what more practitioners should be doing. We should all put some of the profits into buildings and equipment which will improve the quality of veterinary service and at the same time reduce the physical punishment to the practitioner. Build a suitable hospital, buy a microscope, equip and use a laboratory, and render a service which uses the findings of veterinary research.

Will such a hospital increase the veterinarian's income, and will this increase be sufficient to warrant the investment, Dr. Clarke?

Dr. H. E. Clarke (Petaluma, Calif.).—Yes. Our hospital is in an area where dairy herds are large, but the owners find it more economical to bring ailing animals to the hospital for careful nursing, repeated medication, and rapid recovery. Animals are hauled by truck or trailer as far as 60 mi., and the cost of such trucking in the owner's vehicle is less than my charge would be for time and travel. When several treatments are necessary, there is only one travel charge for the full series. The hospital facilities permit us to render a better service for less money, and cattle owners use this service to an extent which increases our income sufficiently to warrant the building and operation of these facilities.

Dr. W. M. Coffee (LaCenter, Ky.).—Operating a hospital or clinic for all types of animals adds to the prestige of the individual veterinarian and of the profession. The large animal hospital need not entail the expense of a small animal hospital in a large city. The use of our facilities permits us to treat more patients at less cost to the owner without reducing the margin of profit per animal treated.

Horse practice has changed from a mule and farm horse basis to a light-legged, riding, and jumping horse clientele. Owners of riding horses attach a high sentimental value to their animals. They think of veterinary service more promptly, and they own trucks and trailers to transport the animals to hospitals which render a complete service promptly.

Feeders of cattle and hogs have learned that they can bring a truck load of animals to our clinic for bleeding, vaccinating, dehorning, emasculation, etc. and, by using our loading chutes, stock pens, and stanchions, the necessary veterinary work can be done promptly, with a minimum of handling, and at less cost than it could be done at home. Cattle and hogs purchased at market centers frequently are trucked miles out of the direct way in order to stop at our clinic for the types of service mentioned. A truck or trailer may unload 30 to 40 head of cattle or hogs and be ready to leave again in half an hour.

Our hospital is not elaborate. It was built in 1936 for about $3,000, right at the edge of a town of 700. We have all the advantages of the city (water, electricity, gas, etc.) and also the pen room which is seldom available in the city. The hospital proper has room for 60 dogs and dog surgery, a dozen horses or cows, a diagnostic laboratory modestly equipped, and a general layout similar to that described by Dr. Erickson. In addition, we have chutes for unloading and loading, two stock pens, stocks for handling cows, horses, and pigs, and labor-saving facilities for handling animals singly or in groups.

This practice in the clinic and the surrounding territory permits me to employ three veterinarians and keeps all four of us busy. One man never leaves the hospital, one specializes in cattle work, one does the general country practice, and I take the jobs that nobody else wants. We have one lay assistant and an office girl.

Country surgery is reduced to a minimum, cows being sent to the hospital for cesarean section, rumenotomy, embryotomy, etc. Hogs come in for cesarean, castration of large boars, hernias, cryptorchids, prolapse of the rectum with intestional anastomosis, etc.

We find that the hospital and clinic increase our income. They attract good clients, they permit a degree of specialization, and they reduce the overhead or operating cost by providing one office for three or four veterinarians, thus eliminating a need for additional telephones, heat, light, water, bookkeeping, lay assistans, etc.

Moderator Frick.—How do you dispose of the carcasses of dead animals?

Dr. Coffee.—In Kentucky, the state issues a special license to operators of special trucks for the daily collection of dead animals.

Moderator Frick.—We like to use all of our carcasses for student-teaching purposes. Animals that die of noninfectious diseases are often salvaged, so that the meat can be used for feeding of animals in the hospital, sent to the local zoo, or otherwise utilized.

Dr. Stanley E. Philips (Medford, Ore.).—What is your base hospital charge?

Moderator Frick.—At Kansas State College, we charge $1.00 a day for a horse or a cow.

Dr. Coffee.—We charge $3.00 a day for a horse or a cow, and $1.50 for dogs. In each instance, drugs are extra.

Dr. K. Richard Preusser (Orland, Calif.).—How are hospital assistants paid?

Dr. Clarke.—My partner and I work on a percentage basis. I own the hospital and the instruments and get 60 per cent. My partner has little or no investment and gets 40 per cent. We pay all bills before dividing the profit, and each gets the same amount of time off.

Dr. Erickson.—I furnish everything for the assistant except his transportation. Each week or each month the assistant adds all of the calls he has made, whether cash or charge, and I pay him half of the total. Unpaid accounts are then mine for collection.

Dr. Coffee.—Until two years ago, I paid my assistants a basic salary plus a percentage of the net profits—but not of accounts receivable. The two men who are with me now are partners; we each own one-third of the practice. I own the property, the clinic, and all instruments and equipment. The partnership pays me rent on a nominal basis. We try to pay a fairly uniform monthly salary, keeping some of the surplus in reserve for emergencies and for division at the end of the year.

Moderator Frick.—Is it ethical for a veterinarian to dispense pharmaceutical and biological products? Where can we draw the line between dispensing and merchandising?

Dr. Smith.—I do not dispense biological products, but I do dispense those drugs which can be bought at drug stores. I try to compete with the druggist on prices of these items. I have not dispensed any items for treatment of mastitis.

Dr. Coffee.—Because I know more about dispensing drugs for animals than the druggist does, I dispense drugs. We find that it attracts clients. They come in to discuss their animal disease problems from the standpoint of the animals involved, rather than from the angle of the profit to be derived from sale of the medicine.

Once or twice a year, we coöperate with the county agent and the extension agent in meetings on feed conservation, parasite control, disease prevention, and subjects of a similar nature. We also coöperate with livestock organizations. In one instance, we

spent an hour and a half on each of five days at meetings in various parts of the county. A temporary laboratory was set up, chiefly for making fecal examinations. As a result of that series of meetings, we sold more than 200 gallons of liquid phenothiazine, and administered more than 60 per cent of it. We also fill our own prescriptions for mineral supplements, etc.

Dr. R. C. Snyder (Upper Darby, Pa.).—Your Committee on Ethics believes that dispensing is ethical as an adjunct to professional service, but that it is unethical when it becomes a business which overshadows the professional services.

Moderator Frick.—In my teaching, students are advised to differentiate between dispensing and merchandising. We dispense medicine only when the animal has been examined. This includes refilling a prescription for a former patient either with the same formula or something slightly different. The sale of medicine for use on animals which the veterinarian has not seen and is not familiar with is considered merchandising.

Dr. Guy V. Spayth (Bloomville, Ohio).—As I see it, there is a distinct difference between dispensing and selling or merchandising. The veterinarian dispenses, using his own private label carrying directions for use.

While driving through Wyoming on the way out here, we visited an office bearing the inscription "Veterinary Supplies." It was operated by three veterinarians, and from one who was on duty we were shocked to learn that anything in stock—pharmaceutical and biological—was sold to laymen, with syringes and instruments needed for administration. We were even more shocked to learn that this is common throughout the West, as verified by several subsequent stops.

Dr. D. E. Barr (Fresno, Calif.).—I purchased my hospital from a veterinarian who sold horse meat and other dog food. The practice has been discontinued, but the former practitioner still insists that it provided him an opportunity to keep in touch with former patients, and sometimes to forestall serious trouble because the owners discussed the progressing condition early in its course.

Referring calls for dog foods, harnesses, etc., to pet shops has not been reflected, in my experience, by a return of the courtesy when health was involved. Only after all of the remedies for sale by the pet shop had been used unsuccessfully, and the patient was at death's door, was it referred to us by the owner of the pet shop.

Moderator Frick.—In conclusion, it seems to boil down to the fact that each one of us must live with his own conscience, and that we cannot formulate a broad rule which will determine what is ethical dispensing for all practitioners and under all conditions.

Notes from Farm and Home Week—University of Illinois

Native Wisconsin ewes, fed a ration which caused them to gain weight at breeding time, gave birth to more twin lambs than controls fed a maintenance ration. . . . The administration of 10 mg. of progesterone daily for thirteen consecutive days retarded normal estrus. Three to three and a half days after cessation of administration, all ewes came into heat.—*L. E. Casida, Wisconsin.*

• • •

The maintenance of accurate breeding records is essential to successful handling of reproductive problems, and they often make the diagnosis apparent. . . . Success in controlling breeding diseases depends upon an accurate diagnosis and the willingness of the herd owner to carry out certain management practices. . . . Brucella, Trichomonas, Vibrio, and Corynebacterium, listed in the order of importance, are the infections met most frequently in dealing with breeding diseases.—*H. E. Kingman, Wyoming.*

• • •

Malnutrition often affects the development of the pelvic bones, and malformations may later present a reproductive problem. . . . Actually, the processes of reproduction never stop. . . . Malnutrition may delay sexual maturity. . . . Nutritional insufficiencies may result from inadequate quantities of feed or from lack of certain ingredients. . . . Malnutrition is usually associated with a decreased production of spermatozoa, ova, and milk. . . . Approximately 1 per cent of the calcium in an animal's body is in the soft tissues. It assists in the maintenance of the proper epithelial tone and, therefore, may be important at the time of ovum implantation.—*T. S. Hamilton, Illinois.*

• • •

Trichomoniasis is spread only at the time of breeding. . . . A ninety-day delay in the breeding of animals infected with *Vibrio foetus* may result in a spontaneous recovery from the disease.—*L. E. Boley, Illinois.*

Laboratory Aids in the Diagnosis of Disease

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DIAGNOSIS, today, depends much on the use of various laboratory tests and other procedures to differentiate certain diseases. Some of these tests are highly specific and are diagnostic of certain conditions, even when clinical symptoms are lacking; but their efficient use is dependent on clinical examination and interpretation. They, therefore, do not replace clinical diagnosis, but are an important aid to it.

There are many kinds of laboratory tests used in diagnosis. They employ physical, chemical, and biologic methods for the determination or measurement of alterations that occur with, or are indicative of, certain ailments. It would be impractical and unwise to attempt to discuss all of the laboratory tests used in diagnosis, because many of these require the use of special facilities which are not generally available. And, too, only a small number of the known laboratory diagnostic tests are important in veterinary medicine. Therefore, this discussion will deal briefly with the uses of some of the commonly used tests.

PHYSICIAL METHODS OF EXAMINATION

The physical methods of examination employ the microscope, roentgen rays, hydrometer, spectrophotometer, electrocardiograph, electroencephalograph, and other similar instruments. The microscope, undoubtedly, is the physical aid most widely used in diagnosis. Its most important use is to aid in detecting and distinguishing bacterial and parasitic organisms, ova of parasites, blood and tissue cells, and for the examination of urine sediments. A more frequent use of the microscope in diagnosis is urged. Not only would it tend to enhance diagnosis, but also, in many instances, it would lead to a better understanding of the etiology and pathology of diseases.

The roentgenograph is used extensively for the diagnosis of fractures in small animals. It also has been used to visualize fractures in horses and other large animals, but its use in this field is limited largely to fractures in the limbs of these animals. The roentgenograph can be used effectively in the diagnosis of pregnancy and certain dental conditions in small animals, and to visualize calculi in the urinary tract, skeletal defects or foreign bodies in the digestive tract and other sites; but an object or lesion cannot be visualized by the roentgenograph unless it is more or less radiopaque than the tissues or viscus in which it is situated. This is one of the factors which limits the use of this diagnostic agent. Radiotranslucent foreign bodies situated in the digestive tract may be visualized with the roentgenograph if some radiopaque substance is introduced into the tract by mouth or rectum. This also is true of lesions situated in the urinary tract and the spinal canal.

The hydrometer is used in veterinary diagnosis chiefly to determine the specific gravity of urine. This is an important aid in the diagnosis of diabetes and certain renal diseases. The specific gravity of urine is increased when diabetes mellitus is present and decreased in the presence of diabetes insipidus or tubular nephritis.

The spectrophotometer may be used to determine the hemoglobin and bile concentration of blood, but other, more available methods are commonly used for this in veterinary medicine.

The electrocardiograph is an important diagnostic aid in human medicine, but not in veterinary medicine because cardiac ailments occur infrequently in animals and the electrocardiograms of animals are difficult to interpret.

The electroencephalograph is used to detect abnormalities in brain function and to localize lesions in the brain. It is used extensively for the diagnosis of nervous ailments in man, but as yet it has not been used in veterinary diagnosis. If it should be found that this instrument can detect altered brain function in dogs, it may help to differentiate some canine nervous ailments. This needs further investigation.

CHEMICAL TESTS

Some of the chemical tests are specific for certain diseases, whereas others merely add further support to the clinical diagnosis. Most of the chemical tests used in veterinary medicine deal with substances in the blood or urine. Tests which determine the concentration of sugar in the blood and urine are used in the diagnosis of dia-

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betes mellitus and of certain nutritional ailments in pigs. A moderate elevation of the sugar concentration of the blood may not be significant, but a marked increase is suggestive of diabetes mellitus. A marked decrease of the amount of sugar present in the blood is indicative of impaired hepatic function. This condition is seen rather frequently in baby pigs.

Much significance is attached to the tests which determine the concentration of urea in the blood. An increase of the amount of urea present in the blood is indicative of impaired renal function, as in nephritis or hypertension, but the concentration of urea also may be high because of ingestion of increased amounts of protein in the diet and increased metabolism of body protein. Since the metabolism of the body protein may be increased by fever and toxemia, which are common to many diseases, an increase in amount of urea in the blood is not pathognomonic of any one condition. Its interpretation, therefore, requires careful clinical consideration.

An elevation in the level of creatinine in the blood is significant of destructive renal disease. Whenever the creatinine content of the blood rises to more than 2 mg./100 cc. of blood it is abnormal, and in the dog, when it rises to more than 4 mg., it indicates that irreparable renal damage has occurred and the animal will die. Therefore, this test is of both diagnostic and prognostic importance.

Tests which determine the calcium and phosphorus content of the blood usually are employed only for the diagnosis of milk fever, rickets, and hyperparathyroidism. The blood calcium is decreased in milk fever of cows and in animals which have rickets. Therefore, this test is only an aid to clinical diagnosis. A rise in the level of calcium present in the blood is suggestive of hyperparathyroidism.

Examination of the urine employs physical, chemical, and biologic tests. The use of the hydrometer to determine the specific gravity of the urine and the use of the microscope to identify bacterial organisms, tissue cells, and the character of sediment in urine have already been mentioned. But it also is important to measure the amount voided daily. This too is a physical test. An increase of the amount occurs with diabetes and with tubular nephritis. The amount voided is decreased when glomerular nephritis is present. But these tests, too, require careful clinical interpretation because the amount of urine voided daily also is affected by the diet, fluid intake, environmental temperatures, and fever.

Chemical tests which determine the amount of sugar present in the urine are used for the diagnosis of diabetes mellitus. The mere presence of sugar in the urine is abnormal and is diagnostic of diabetes mellitus.

Tests which determine the presence of acetone in the urine are employed in the diagnosis of acetonemia and acidosis.

Chemical tests also are used to determine the presence and amount of albumin, nitrogen, bile, hemoglobin, and other normal or abnormal substances found in the urine. But these tests, too, are only an aid to the clinical diagnosis.

The presence of blood cells in the urine is indicative of inflammatory disease, parasites, calculus, or certain kinds of neoplasms which occur in the urinary tract. But blood may also occur in the urine from other causes. The presence of erythrocytes can be determined by use of the microscope and by chemical tests. The presence of leucocytes, fixed tissue cells, and casts is determined only by microscopic examination. Their significance, too, usually can be determined only by clinical examination of the animal from which the specimen was obtained.

Examination of the blood, too, employs physical, chemical, and biologic tests. Use of the microscope to observe and distinguish blood cells has already been mentioned. It is an important laboratory aid that is used in differentiating diseases of the blood. The hemoglobin content of the blood can be determined by both physical and chemical tests.

BIOLOGIC TESTS

Various biologic tests which employ blood are also used in diagnosis. The best known of these is the agglutination test used extensively for the diagnosis of brucellosis in mammals and pullorum disease in fowl, and also in the diagnosis of leptospirosis, tularemia, and various other diseases. It is one of the most specific tests used in diagnosis.

The complement-fixation and precipitation tests, too, are used for the diagnosis of certain infectious diseases, but they have not been used much in veterinary medicine.

The sedimentation test is used extensively for the diagnosis of certain diseases in man and recently has come into use in veterinary diagnosis. Its development is based on the discovery that the presence of chronic inflammatory disease in the body increases the rate of precipitation of the erythrocytes. In veterinary medicine, this test may be useful in the diagnosis of metritis in the bitch.

Culturing bacteria on various artificial and natural mediums is perhaps the most

widely used biologic test. It is used to determine the presence of bacteria and to distinguish them. The importance of this test is common knowledge and will not be mentioned further in this discussion.

Neutralization tests and animal inoculation are biologic methods used to detect certain viruses. These tests are an important means of differentiating the various viruses which affect animals. Certain virus diseases may also be identified by the presence of specific cell-inclusion bodies which can be detected and identified by microscopic examination of the affected tissues.

Thus far, parasites have been only mentioned. There are numerous parasitic organisms that affect lower animals. They invade or attack directly or indirectly all of the organs and tissues in the body and produce a variety of specific ailments. Some of them are microscopic and attack only individual cells, whereas others, both large and small, attack a whole organ or merely subsist, as some tapeworms do, by ingesting material present in the intestinal tract. Because these parasites vary in size and site of habitat, their detection requires various laboratory procedures and tests. Some parasites can be distinguished only by animal inoculation tests and others only by culturing them on an artificially prepared medium, but the vast majority of them can be both detected and distinguished by microscopic examination of the infected material. The microscope undoubtedly has its greatest usefulness in this field of diagnosis.

The foregoing discussion has dealt too briefly with this important subject to be of any technical value, but it is hoped that this brief mention of the use of some laboratory tests will add to the general appreciation of their importance.

Ketosis

The good cows have ketosis. . . . Ketones remain in the blood after clinical recovery. This may not be a general rule, but is often seen. . . . Ketosis occurs seasonally, usually in late winter and early spring. Poor forage may be a factor, and the feeding of hay of good quality and a liberal grain allowance is good insurance against ketosis. . . . We know that chloral hydrate helps to relieve the condition, but do not know why. Possibly because it increases metabolism of tissue protein. . . . When glucose is injected intravenously, it should be injected very slowly. Glucose is more effective if reduced to a concentration of 5 per cent. . . . When it is suspected that improper digestion may be a factor in ketosis, and that cobalt should be added, this may be done by dissolving 1 oz. of cobalt sulfate in 1 gal. of water. This solution may be fed at the rate of 1 oz. daily for four or five days, and then ½ oz. daily for another three or four days. Cobalt acts on the rumen microflora, stimulating them to produce more vitamin B which, in turn, stimulates appetite and induces ingestion of a larger amount of feed. This effect is lost if the solution is injected instead of being fed. . . . The injection of adrenal cortex extract may have a beneficial effect on the course and termination of acetonemia, but it will not be widely used in the immediate future because the present price of a dose for man is more than $15.00.—*Excerpts from a talk by Dr. Roger P. Link, Illinois.*

Warning on Use of Tyrothricin

In an article in the *Archives of Otolaryngology* (April, 1948), Ernest M. Seydell and William P. McKnight cite 7 human cases in which they prescribed tyrothricin intranasally.

Most of the conditions treated were rhinitis and sinusitis. In all the cases, a disturbance in olfaction was noted about three days following the first administration of the tyrothricin. All cases progressed rapidly to a complete paralysis of the olfactory and gustatory sensations. Experiments with intravenous injections of camphor water seemed to prove that the paralysis was of central origin. During the several weeks following the initial anosmia, some recovery of the sense of smell and taste was noted. However, in all cases, the sense of smell was perverted so that foods, beverages, and tobacco smoke caused revolting and disgusting odors, accompanied by nausea and vomiting. Anorexia and malnutrition also resulted in most cases. Up to the time of the report, or nine months after the first of the 7 cases was observed, none of the 7 patients had recovered a normal sense of taste and smell.

In view of the growing use of tyrothricin intranasally, and in certain dermatoses in dogs, a word of warning seems to be indicated. If dogs react as human beings do, it would be little short of criminal to use tyrothricin on the hunting breeds, with the possibility of irreparable damage to the sense of smell.—*G. H. Ludins, D.V.M., Hartford, Conn.*

Canadian vs. Canadien

The word "Canadian," as used on page 123, of the March, 1949, JOURNAL (Our Passing Civilization), refers to the aborigines of Canada, and is sometimes spelled "Canadien."

Balantidium Infection in the Dog

Balantidium infection in the dog was first reported in 1948 by Dikmans.[1] The dog from which the parasite was obtained succumbed following a severe diarrhea, and, on necropsy, ulcerated areas were found in the intestine. The case reported here is, as far as we can determine, the second reported case in the dog.

A male Pointer, 3 or 4 years old, was presented for treatment on Dec. 28, 1948, to Dr. Williams. The owner stated that the dog had eaten the intestines of a hog which had been killed on the farm. When admitted to the hospital, the emaciated patient had suffered for several days from a bloody diarrhea which developed several days after eating the pig intestines. Fecal examination revealed a heavy Trichuris infection. Following treatment with N-butyl chloride, there was no improvement except that the blood disappeared from the feces, which may have been coincidental. Kaopectate, belladonna, and bismuth failed to check the extreme diarrhea. On Jan. 5, 1949, large ciliated Protozoa, identical in appearance with *Balantidium coli*, were found in large numbers in the feces. As was true with the first specimen received by Dikmans, an unpreserved fecal specimen submitted to the senior author for confirmation failed to show the ciliates because of their degeneration in transit. A second specimen, mixed with an equal amount of 5 per cent formalin, contained many of the organisms. Measurements of 25 organisms ranged from 40 to 68μ (microns) (average 55.2) in width and 50 to 88μ (average 72.3) in length.

TABLE I

Tube	Drug and description	Amount	Results 2 hr.	Results 14 hr.
1	None, control.	.....	Alive	Alive
2	Neoprontosil, 5% (Winthrop).	5.0 drops	Alive	Alive
3	Theradye, methylene blue 3.55 Gm./100 cc. with calcium borogluconate (Jen-Sal).	5.0 drops	Alive	Alive
4	Acriflavin, 1:100 aqueous solution	5.0 drops	Alive	Alive
5	Disulfalac, sodium sulfathiazole 2½%, sodium sulfapyridine 2½%, dextrose 5% (Pitman-Moore).	5.0 drops	Alive	Dead
6	Sulmet, sodium sulfamethazine, 25% (Lederle).	5.0 drops	Dead	Dead
7	Sulfaguanidine.	0.5 Gm.	Alive	Alive

Inasmuch as there is no specific treatment for Balantidium infection in man, symptomatic treatment was given. Sulfaguanidine, in rather heavy doses, was administered three times daily. After two days, there was no indication of improvement. At this time, a large quantity of feces was collected, thoroughly mixed, and dispensed in 2-cc. amounts into each of seven test tubes. With these, an attempt was made to determine the *in vitro* tolerance of the organism to various drugs that might be used in the successful treatment of the infection. The results are summarized in table 1.

These results suggested sulmet as the drug of choice of those tried, and treatment with it was started immediately. It was injected intraperitoneally in the following amounts: on the evening of January 7, 20 cc.; January 8, 15 cc., a.m. and p.m.; January 9 to 14 inclusive, 10 cc., a.m. and p.m. At the same time, the dog was given good food with plenty of milk, cod liver oil, and liver extract, along with kaolin and pectin compounds for the diarrhea. During the last few days of treatment, the dog showed some anemia but remained active and had a good appetite.

Fecal examination was negative for Balantidium on January 15, at which time treatment was discontinued. On January 21, the dog was treated a second time with N-butyl chloride for the Trichuris infection. By this time, the diarrhea was considerably checked and fecal examinations were negative for Balantidium until the dog was discharged on January 24. The owner had several other dogs under the same general environmental conditions, none of which have been visibly affected.

In this case, sodium sufamethazine appeared to be of value in the chemotherapy of Balantidium infection, but it is possible that the disappearance of the Protozoa from the feces and the recovery of the dog could have been the result of a self-limiting infection.—*W. S. Bailey, D.V.M., M.S., Auburn, Ala., and A. G. Williams, D.V.M., M.S., Chattanooga, Tenn.*

The sulfonamides work more effectively in animals with high body temperature, because the blood concentrations resulting from oral administration of the drugs are higher.

The best way to control blackhead in turkeys is to prevent the poults from becoming infested with Heterakis.—*A. R. Cowser, Illinois.*

Dr. Bailey, temporarily on leave from the Alabama Polytechnic Institute, Auburn, Ala., is now at the Johns Hopkins University School of Hygiene, Baltimore, Md.

[1]Dikmans, G.: The Dog, *Canis Familiaris*, a New Host of Balantidium sp. Proc. Helm. Soc. Wash., *15*, (1948): 40-41.

NUTRITION

Allergy and Antihistamine Therapy in Veterinary Practice

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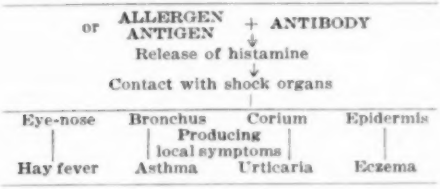
THIS PAPER presents data on the clinical results obtained with the use of antiallergic drugs, especially pyribenzamine, in domestic animals. As comparatively little is known about allergy in the so-called lower animals, the theory now generally accepted in regard to the mechanism of allergy will be discussed, because this offers a satisfactory explanation for the effectiveness of the new therapeutic agents. The interest in these substances is, indeed, a practical and theoretic one—practical, because for the first time it provides us with a satisfactory and specific therapy of allergic diseases; theoretic, because the satisfactory results now obtainable with this form of chemotherapy throw light on the mechanism of allergic reactions in general.

Schematic Explanation of Allergic Reactions



According to the accepted theory, allergic manifestations such as anaphylaxis, urticaria, dermatitis, etc., are the result of a sensitization with so-called allergens. Animals become sensitized to a great variety of substances contained in food, pollen, etc. During the process of sensitization, specific antibodies are formed and, upon renewed contact with the allergen, a combination between the antibody and the allergen takes place, leading to the clinical symptoms of allergic diseases. Allergic manifestations are brought about by the liberation of an allergic poison, which, in most instances, has been recognized as histamine or histamine-like substances.

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Histamine is normally present in bound form in various tissues, especially those of skin, liver, lungs, and in white blood cells, platelets, etc. During the antigen-antibody reaction, histamine is liberated. Since it is a potent poison for most animal species, its liberation in great amounts produces symptoms of intoxication which vary in the different species. In dogs, for instance, it causes spasm of the hepatic veins, a fall of blood pressure, increased capillary permeability, diarrhea, dyspnea, salivation, increased hyperperistalsis, etc. In horses and cattle, histamine effects are chiefly characterized by diarrhea. Several investigators have also reported that it produces symptoms similar to laminitis and pulmonary emphysema.

Symptoms following the injection of histamine in experimental animals are similar to, or possibly identical with, those seen in naturally occurring attacks of allergy or anaphylaxis. Furthermore, this significance of histamine as being the allergic poison is further demonstrated by the fact that blood histamine is increased in many cases of allergic manifestations.

The revelation of the rôle played by histamine in allergy has led the way for the investigation and discovery of new drugs which are capable of nullifying or antagonizing the toxic effects of histamine released during allergic reactions, *i.e.*, substances which have been introduced into antihistaminic therapy — pyribenzamine,

TABLE I—Results of the Treatment of Allergy in Dogs with Pyribenzamine

Diagnosis	Cases treated	Results		
		Good	Improved	Negative
Eczema	100	35	30	35
Urticaria	20	12	8	0
Asthma (cough)	10	4	3	3
Edema	27	17	5	5
Conjunctivitis	3	1	1	1
Control of anaphylaxis		Good results reported generally, no individual histories		
Total	160	43.1%	29.3%	27.5%

Dose: 25 to 75 mg. from one to four times daily.

benadryl, neoantergan, etc. In human medicine, antihistaminic therapy has been used to control hay fever, urticaria, serum disease, pruritus, etc. So far, however, little clinical evidence has been obtained to demonstrate the effectiveness and practicability of this therapy in domestic animals.

Information in this paper may be regarded as a preliminary report and only the results of one antihistaminic compound, pyribenzamine, will be presented here. Other recognized antihistaminic products may be capable of producing similar results. However, for the time being, no comparison between various substances can be made.

TABLE 2—Results of the Treatment of Allergy in Horses with Pyribenzamine

Diagnosis	Cases treated	Results		
		Good	Improved	Negative
Laminitis	11	6	4	1
Azoturia	6	5	0	1
Food allergy	1	1	0	0
Bee stings	1	1	0	0
Pulmonary edema	1	1	0	0

Dose: 300 to 800 mg. injected intravenously in the form of a 2 per cent sterile aqueous solution.

ADMINISTRATION AND DOSAGE

The administration and dosage of antihistaminic drugs, especially pyribenzamine, depend largely upon individual needs, as well as upon the tolerance of the patient. For small animals, oral treatment is recommended since the parenteral administration of large doses, particularly by the intravenous route, may produce acute hypotension or even cerebral shock.* Large animals, however, such as horses and cattle, are best treated by the intravenous route. The dosage for dogs and other small animals is from 25 to 75 mg. at intervals of two to three hours as long as is indicated. For horses and cows, the dose is from 200 to 600 mg., depending upon the condition, weight, and age of the patient. Intravenous injections should be made slowly and at body temperature and, of course, as aseptically as possible. These precautions are advisable because pyribenzamine is a powerful drug when administered intravenously and is likely to cause a high degree of nervousness, particularly in susceptible animals. For this reason, it is advisable to commence with a relatively small dose and gradually increase it until the desired results have been obtained.

As with many other powerful drugs, antihistaminic products sometimes show side effects. Few have been reported so far in domestic animals. In dogs, vomiting may occur in a relatively small percentage of cases, while others may show symptoms of nervousness. In a few cases, treatment may have to be discontinued. In large animals, the following side effects have been reported: nervousness or excitability, muscular trembling, salivation, temporary cloudiness of the eyes, bellowing (in cattle), champing of the jaws and twitching of the lower lip in horses, etc. It should be stated that while these symptoms may be rather alarming to those who have not had previous experience, no losses have been reported and these side reactions usually subside in from ten to twenty-five minutes without any apparent ill effects. In cats, it is interesting to note that a few reports have been received indicating that this species does not tolerate pyribenzamine very well. Consequently, cats should not be treated until further information is available.

Pyribenzamine has been found to produce relief in 65 to 80 per cent of allergic dermatoses in dogs; its effectiveness ranges from complete control of symptoms to an appreciable degree of relief. The percentage of good results, as presented here, may have been increased if positive diagnoses of allergic dermatoses had been made in these animals. As you are all aware, allergy in dogs is difficult to differentiate from nonallergic conditions. In this connection, antihistaminic drugs may help to make a more accurate diagnosis. In fact, many physicians as well as veterinarians suggest pyribenzamine may be used to advantage as a diagnostic aid. In other words, they suggest that allergy may be ruled out from the diagnosis with a reasonable degree of assurance if pyribenzamine does not produce beneficial results. Such a generalization, however, is not entirely correct because there are definite and well-established cases of true allergy which, for reasons unknown, do not respond to antihistaminic therapy.

In addition to various allergic lesions of the skin like urticaria, pruritus, dermatitis, eczema, etc., asthmatic conditions, with or without coughing, respond well to treatment with pyribenzamine. The local application of pyribenzamine in ointment form has, in the case of human patients, produced good results by allaying irritation of the skin in such conditions as pruritus, poison ivy, scabies, etc. For this reason, its use is recommended for dogs and other animals

*Antihistaminic or antiallergic compounds produce hypotension in dogs when administered *rapidly* by the intravenous route. These changes can be minimized or eliminated by injecting the material *slowly*. In this way, a pressor effect is obtained.

with severe cases of pruritus. Topical treatment, however, should not replace oral treatment but should support it.

Antihistaminic therapy is indicated in anaphylactic shock, particularly in patients that have become sensitized to heterogenous serums such as antidistemper canine serum prepared from horses, etc. It has been shown, experimentally as well as clinically, that anaphylaxis and urticaria can be prevented in some animals which have become

TABLE 3—Results of the Treatment of Allergy in Cattle with Pyribenzamine

Diagnosis	Cases treated	Results		
		Good	Improved	Negative
Mastitis:				
Acute	1	0	0	1
Gangrenous	2	2	0	0
Diarrhea	4	4	0	0
Ketosis	1	1	0	0
Retained placenta	6	6	0	0
Septic metritis	2	2	0	0
Food allergy	2	2	0	0

Dose: approximately the same as in table 2.

sensitized to antiserum. In our own laboratory, it has been demonstrated that anaphylactic shock in previously sensitized animals can be prevented in about 50 per cent of all dogs treated and in almost all guinea pigs. In horses and cattle, laminitis, azoturia, food poisoning, pulmonary edema and and emphysema, retained placenta, ulcerative stomatitis, diarrhea, chronic mucopurulent conjunctivitis, urticaria, septic metritis, tympanitis, and several other conditions associated with allergy respond to intravenous injections of pyribenzamine.

As far as the duration of the effect is concerned, it must be emphasized that this therapy is considered symptomatic in most instances and may have to be continued for as long as the patient is subjected to the influence of the offending allergen. However, in some cases, the continued treatment of heaves (pulmonary emphysema) may produce permanent results, although more clinical evidence is necessary to prove this.

SUMMARY

Antihistaminic therapy with new drugs, like pyribenzamine, provide a new and important approach in controlling allergic symptoms not only in man but also in animals. The scope of this therapy is increasing steadily and the practical results obtained in the treatment of allergic diseases already has proved that a number of obscure and as yet unrecognized pathogenic conditions are connected with the liberation of histamine. In other words, they have been recognized as being of an allergic nature. Thus, antihistaminic therapy has not only proved its effectiveness in actual practice, but it has become a valuable and interesting tool in the hands of the research worker.

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The ruminant is a newly recognized source of protective protein never heretofore considered in the evaluation of feedstuffs.

Alfalfa and probably bluegrass contain certain nutritional elements, not present in other feeds, which are important to fetal development and livability of pigs.

Relationship of Nutrition to Fertility in Animals

(*Continued from March* JOURNAL)

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VITAMIN C

A physiologic justification for the essentiality of vitamin C in the reproduction of animals can be argued on the bases that there appears to be a relationship between this substance and vitamin A;[113, 154] the level of vitamin C is high in a number of tissues known to be concerned with reproduction;[15, 92, 112, 134] vitamin C influences, and is influenced by, a number of hormones related to reproduction;[3, 4, 34, 45, 84, 139, 147, 148] and the plasma level of ascorbic acid normally increases during estrus in the cow.[156]

Data which oppose a direct, or even a secondary, rôle of vitamin C in animal reproduction show that, of all species, only man, monkeys, and guinea pigs manifest the symptoms of scurvy. Although some evidence[55] indicates the possibility of scorbutic symptoms occuring in cattle under certain conditions, vitamin C appears to be produced in abundant quantities in the tissues of this and other ruminant species when normal conditions prevail.[88, 93, 96, 109] Diets sufficiently low in vitamin C to produce the usual symptoms of scurvy did not disturb the estrous cycle or ovulation in guinea pigs.[58, 110] Male guinea pigs, severely stricken with scurvy, show normal testicular tissue and spermatozoa.[57] Mason[112] reported that no specific reproductive disturbance is found in man, monkeys, and guinea pigs with scurvy.

There are a number of reports which seem to indicate that the injection of vitamin C or the feeding of trichlorobutanol, an alcohol which stimulates the synthesis of ascorbic acid in animals,[95, 101, 102] improves fertility in both the male and female of the bovine species. Various workers have considerable unpublished data dealing with this kind of therapy, but, until these data are available, an adequate analysis of the practice is impossible. Vitamin C therapy for sterile cows appears to have been introduced by Phillips *et al.*[156] In a limited number of cows (7) with a regular breeding history, these workers[156] observed that the plasma ascorbic acid level increased greatly during the period from mid-to-late estrus over that found during diestrus. Cows described as "hard to settle" did not manifest this increase. Based upon these findings, it followed that ascorbic acid injected into cows prior to estrus may promote conception, perhaps in the development of corpus luteum, since this body is of high ascorbic acid content. After treating 17 cows with ascorbic acid, these workers concluded that: (1) 60 per cent of hard to settle cows respond; (2) cows with cystic ovaries or anatomical abnormalities do not respond; and (3) the mechanism involved may concern the corpus luteum and its needs for vitamin C, since this structure undergoes rapid development following ovulation and is so essential to pregnancy. Barker[9] reported on the treatment of 4 cows with normal reproductive tracts. One conceived but treatment was ineffective in the 3 remaining cows. However, this investigator indicated that ascorbic acid therapy may have some value in the maintenance of early pregnancy. The chief weaknesses of this experiment and others are the lack of satisfactory controls and of a sufficient number of animals.

An interesting observation relative to vitamin C therapy, reported by Asdell[6] recently in a symposium on sterility in cattle, is that the cases of apparent success in the use of this vitamin have been in connection with cows of regular breeding history and of no definite pathology. He felt inclined to discount these results on the basis that animals with such a history frequently recover fertility spontaneously and that experiments of this nature have not been adequately controlled.

A beneficial effect of ascorbic acid upon the sexual activity and semen production of bulls may be indicated,[45, 135, 148] although Madsen *et al.*[104] were not able to improve the poor character of semen and the low sexual activity of vitamin A deficient bulls by injections of ascorbic acid. Lardy and Phillips[97] found that bulls whose semen contained less than 2 mg. of ascorbic acid per 100 cc. were of low fertility; whereas, bulls with good breeding records yielded semen containing 3 to 8 mg. of ascorbic acid per 100 cc. These findings led to a later study involving ascorbic acid therapy[135] in 29 bulls. When ascorbic acid was injected subcutaneously, bulls were reported to have shown increased sex interest and the quality of semen is said to have been greatly improved. A favorable response was observed in about 80 per cent of the bulls with histories of low potency, slow breeding, and general sexual indifference.[135] Reid *et al.*[140] have shown that the semen of some bulls contains large quantities of sulfhydryl substances which are measured as ascorbic acid when the method employed by Phillips *et al.*[135] and others is used. This finding tends to discount the physiologic basis for ascorbic acid therapy in bulls.

Davis and Cole[39] found good breeding performance of stallions to be associated with good pastures and indicated that stallions performing poorly have low plasma levels of ascorbic acid.

The usual rations fed to cattle and the *in vivo* synthesis of ascorbic acid in this species would seem to ensure that a deficiency of vitamin C is unlikely. However, it is not known whether or not an adequacy of vitamin C exists under practical conditions such as those in which Hart and Guilbert[74] found marked vitamin A deficiency, *i.e.*, long periods during which dry, bleached range feed was fed. This may depend upon the extent to which this type of feed contains ascorbic acid synthesizing, stimulating substances.[101, 102]

B-Complex Vitamins

Other vitamins may be involved to some degree in the reproduction of animals, but because they exert numerous effects and are influenced by various conditions, a complicated picture often prevails making it practically impossible to examine their influence upon fertility. Many B-complex vitamins are known to have a pronounced effect on the appetite.

A deficiency of one of these vitamins may cause inanition which may, in turn, influence fertility by introducing other dietary lacks. Therefore, reduced fertility may be complicated by a number of factors or conditions. Evans[54] observed normal testes in rats dying from a deficiency of B-complex vitamins. A deficiency of these factors did not affect the estrous cycle or stop ovulation in the female rat,[49] though Evans and Bishop[50] later reported that ovulatory function in the female rat is more severely affected by a deficiency of B-complex vitamins than is general health. Parkes and Drummond[129] observed complete sterility which they attributed to a deficiency of B-complex vitamins in the diets of rats. Thiamin and riboflavin deficiencies were believed to cause atrophied testes and ovaries in pigeons.[115] To what extent these reported symptoms are attributable to other dietary deficiencies is not known. By virtue of ruminal, cecal, and intestinal synthesis, many animal species are in no grave danger of suffering from deficiencies of these factors.

Vitamin D

A sufficient lack of vitamin D to cause structural deformities in the animal body could conceivably influence reproductive performance. A few cows receiving a diet low in vitamin D failed to come into heat.[168]

Phosphorus

Frequent mention is made in the literature relating minerals, particularly phosphorus, calcium, and manganese, to the fertility of animals in various countries. Of these elements, a deficiency of phosphorus seems to be most common.

A number of investigations[20, 40, 72, 103, 134] have revealed phosphorus deficiency in animals maintained under field conditions in which the forage (usually rangeland) contained somewhat less than 0.1 per cent phosphorus; little or no grain was fed; if grain was fed, it was generally low in protein; the soil was deficient in phosphorus; the area of observation was frequently drought-stricken and no phosphorus supplement was provided for the animals.

Generally speaking, reproduction is not affected until the usual symptoms of phosphorus deficiency appear. Many of the cases of reproductive failure in cattle on phosphorus-deficient ranges may not be entirely, or, even necessarily, due to a lack of this element, since the low content of phosphorus in the forage is accompanied by a low level of protein.[20, 137] Furthermore, one of the principal symptoms of phosphorus deficiency, namely anorexia, may incriminate other dietary deficiencies as well.[20, 137] Another factor involved in the promotion of a possible multiple deficiency and a state of partial inanition is the lack of palatability in low phosphorous forages.[27, 59, 137] Even though other deficiencies (notably, low levels of protein found in pasture by the South African group) may have existed with that of phosphorus, the extensive investigations of the South African workers would indicate that phosphorus is at least a limiting factor in reproduction.

These reports clearly demonstrate the improvement of fertility in cattle on sparse, arid, phosphorus-deficient pastures when the animals' diets were supplemented with bone meal[156] and dicalcium phosphate.[67] In one experiment, fertility rose from 51 to 80 per cent (in terms of possible calf crop).[156] In another experiment[156] of three years' duration, 66 of 109 cows fed bone meal produced 3 calves; whereas, of 20 control cows (surviving without phosphorus supplement) not 1 produced 3 calves during that period. The cows fed bone meal yielded an 87 per cent calf crop while the controls produced only 56 per cent of possible (assuming possible as 1 calf per cow per annum).[20] Hart and Guilbert[72] and Wheeler[171] obtained a substantial improvement in the percentage of the calf crop by feeding bone meal to range cows. In this report, Hart and Guilbert[72] concluded that the principal difference between good and poor range grass is the mineral and protein content. Later, these workers[73] suggested that carotene was also an important difference.

Although Theiler[160] concluded that calcium and vitamin deficiencies are not concerned in the relationship previously observed between phosphorus deficiency and infertility of cattle,

vitamin A appears to have been a factor involved in the production of blind calves by cows on supposedly uncomplicated phosphorus-deficient rations employed by du Toit, Malan, and Groenewald.[38] Du Toit and Bisschop[39] stated that heifers protected from aphosphorosis by phosphorus supplementation attain sexual maturity earlier than control animals. Symptoms of the naturally occurring phosphorus-deficiency disease were verified by feeding experimental rations low in this element.[39] This study[39] further revealed a marked inhibition of estrus in cows on deficient diets; in all cases except 1, the cows did not exhibit estrus until about one year after calving.

In a more recent report by the Minnesota group[11] in which they developed uncomplicated phosphorus deficiency, an explanation was offered for the eventual recurrence of estrus in 14 cows brought from a phosphorus-deficient area and fed a basal ration deficient only in phosphorus, as reported in their earlier publication.[29] It appeared that the control ration supplied the nutrients which had been denied these animals under natural conditions except phosphorus. Their final conclusion was that an uncomplicated deficiency of phosphorus did not cause abnormal estrus in mature cows although it does appear to reduce breeding efficiency, and that the previously reported reproductive disturbances may be due to complex nutritional deficiencies. Complete cessation of estrus in cows on low-phosphorus rations was observed by Jordan *et al.*[99, 98] Tuff[163, 164] reported essentially the same type of reproductive failure. Guilbert and Hart[70] pointed out that the low phosphorus content of the blood is related to the irregular ovulation history in rats.

Although these experiments showed that an 80 per cent cessation of estrus in sexually mature rats, and a failure of young rats to mature sexually, occurs when low-phosphorus diets are fed, these results were not entirely due to phosphorus deficiency *per se*, but probably due to the high calcium-phosphorus ratio in combination with a low phosphorus level.

The types of reproductive failure, as well as the other symptoms of phosphorus deficiency, manifested in sheep closely resemble those reported for cattle.[15, 150] In their study, showing that a low protein diet is not as severe in its effects on fertility in ewes as one low in both protein and phosphorus, Hart and Miller[76] indicated that further study is required to establish the effects of a low phosphorus intake.

The following summary of reproductive disturbances caused directly or indirectly by a lack of phosphorus has been condensed from the literature: (1) Sexual maturity is delayed.[127] (2) Estrous periods are irregular.[99] Usually, estrus is exhibited once or twice at about normal intervals following parturition. If service is given, the cow may conceive in about the normal percentage of cases. If the cow fails to conceive, estrus generally does not appear until the lactation period ends or until phosphorus is provided. Following a few weeks of dryness (cessation of lactation), estrus again appears.[99] In some cases, estrus completely ceases while the animal is receiving inadequate phosphorus.[99, 98] (3) Ovulation occurs with normal regularity and the ability to conceive is not lost.[127] (4) The calf crop percentage is reduced, with a tendency to produce only 1 calf every two years.[99] (5) There are no reports of abortions occurring on low phosphorus diets, although weak, dead, and blind calves have been mentioned in this connection. (6) Phosphorus deficiency in cattle and sheep appears to be attributable to the lack of phosphorus in the pasture[150] and hay.[99] Impaired fertility appears unlikely in animals, even under range conditions, when receiving protein supplements and/or a supplementary source of phosphorus. (7) No reports appear to have outlined the effects of deficiency on the reproductive capacity of the male animal. (8) Based largely upon the report of Eckles *et al.*[127] and upon inference, it would appear that some of the reproductive disturbances attributed to phosphorus deficiency by many workers may reasonably well be due to various other nutritional deficiencies or to those which a deficiency of phosphorus may aggravate.

CALCIUM

Although a deficiency of calcium in ordinary rations for livestock is remote, some reports have related reduced fertility to a lack of this element.

Fitch *et al.*[56] recorded an experiment in which uncomplicated calcium deficiency was developed in 7 cows. A deficient ration (0.18% calcium) fed for three years did not lower breeding efficiency. In a later experiment[126] in which the calcium content of the ration was reduced to 0.12 per cent, no reproductive troubles were observed. Data presented by Guilbert and Hart[70] show that lowering the level of calcium from 0.82 per cent to 0.22 per cent in a diet adequate in other essentials did not affect growth, estrus, gestation, or lactation in rats during two successive lacation periods.

Apparently, swine are the only farm animals in which a deficiency of calcium results in reproductive upsets.[57] It is not uncommon for a number of pig embryos to atrophy at all stages of development, which in many cases reduces the number of viable pigs born.[21] The number of ova shed by sows was not significantly different in a control and calcium-deficient group; however, sows which had developed severe calcium deficiency symptoms had a tendency to produce an increased number of atrophic fetuses and stillbirths.[21] The

number of pigs born dead of deficient sows progressively increased in succeeding litters and generations. Since this condition did not appear until general health was destroyed, and since a limited number of sows survived the disease, conclusive evidence is lacking that the condition is caused primarily by a lack of calcium. A deficiency of calcium appears to have been only contributory, at best. The composition of the diet used, and the symptoms of the condition manifested, may be indicative of a lack of vitamin E. Estrus and conception occur normally in calcium-deficient sows,[31, 53] even when the disease is sufficiently severe to produce bending of bones and temporary paralysis.

Wall[167] reported the occurrence of abortion in mares on rations sufficiently low in calcium to produce hypocalcemia. The primary cause of abortion, however, appeared to be due to resorption of toxins produced from the feed.

Manganese

Many studies of the effects of manganese deficiency in animals have employed milk diets supplemented with iron and copper. Some of these studies have indicated that a deficiency of manganese under these conditions results in the irregularity or absence of the estrous cycle in the female rat and degeneration of the testicular epithelium of the male rat.[18] Several reports[29, 125, 149] demonstrate that the estrous cycle is not affected by a deficiency of manganese.

The earlier investigations, in which this association with reproduction in the female rat was believed to exist, failed to provide sufficient energy which apparently was the limiting factor in the milk diets used. Skinner *et al.*[149] showed that estrus and ovulation occur normally in rats fed milk diets supplemented with sugar. In addition to the degenerative effects upon rat testes, Orent and McCollum[125] found 100 per cent mortality of the young born of female rats receiving a manganese-free diet. These workers[125] suggested that the effect upon testicular tissue is direct, rather than indirect through the pituitary gland, since a deficiency does not influence the estrous cycle in females.

Smith *et al.*[152] described testes degeneration attributable to manganese deficiency in 3 rabbits. In female rabbits, the ovaries and uteri were significantly smaller than those of the controls, although no definite alterations were revealed in histologic examinations.[1] In a recent report of a more extensive study of the effects of a manganese deficiency upon the rabbit testes, these investigators[45] recorded that 2 out of 9 manganese-deficient rabbits showed mild tubular degeneration upon having received the diet for twelve to twenty-two weeks, whereas, 2 of 12 comparable rats fed up to 4 mg. of manganese daily in addition to the basal ration also manifested some degeneration of the seminiferous tubules. This observation indicates that the testicular degeneration observed in the rat is much more severe than that found in the rabbit.

Although there are no reports available of actual manganese deficiency being produced experimentally or found naturally in ruminants, Lardy *et al.*[98] have indicated that supplementation of a low manganese ration with this element improves the poor quality semen and lowered fertility of some bulls. Since Reid and Ward[141] found that lactating cows retain on the average only 154 mg. of manganese daily regardless of the intake, within the range of 622 to 1,326 mg. daily, it seems practically impossible to devise an otherwise normal ration for cattle which would be deficient in this element.

Other Mineral Elements

Several other mineral elements have been associated with fertility of animals. A conclusive summary of these experiments, however, is precluded by complicated deficiencies in some instances and by the small number of animals used in others.

Bowstead *et al.*[17] found that the regularity of estrus was about the same in ewes fed low cobalt and cobalt-supplemented diets, but that cobalt supplementation resulted in a higher proportion of lambs born strong. Ninety-two per cent of the lambs born of ewes receiving cobalt-supplemented diets were classified as strong as compared with only 48 per cent of the lambs in this classification born of ewes fed a low cobalt diet. The mortality losses soon after birth were 58 and 17 per cent of the lambs born of ewes in the low cobalt and cobalt-supplemented groups, respectively. Mussil[120] reported on a kind of infertility of unknown origin in cows which responded to zinc therapy. The feeding of iron to sows during gestation was said to reduce the number of stillbirths in this species.[5]

Conclusion

It is a fairly common belief that a level of feeding adequate in quantity and quality to produce rapid growth, early maturity, and optimal health in animals is also best for the maintenance of reproductive health. Supporting evidence for this opinion is lacking; there even may be a point near the borderline of inanition that would prolong reproductive life. Much experimentation is required on such problems before the facts may be applied.

This review strongly suggests that livestock in general do not experience specific nutritional deficiencies that perceptibly influence reproduction under good feeding conditions. Under poor feeding conditions, partial starvation or lack of feed may be the major deficiency encountered, which, in turn, may cause the manifestation of symptoms attributable to a lack of more specific nutrients. From the information at hand, it would appear that the quantitative and qualitative requirements for reproduction do not exceed those for growth of young animals or those for maintenance of mature animals, with possibly one or two exceptions. More exhaustive study may alter this.

Much work is needed in which the various aspects of infertility, *i. e.*, various environmental and genetic effects, are examined in controlled experiments from the standpoint of possible interrelationships during the life cycle of animals. There are some reports which indicate that a number of factors determine the degree of fertility, but no studies have been reported in which the interrelationships of these variables have been determined over a lifetime. The over-all problem dealing with fertility requires the attention of the biochemist, physiologist, pathologist, bacteriologist, geneticist, and specialists in various related fields. In order to successfully undertake action in the various aspects of infertility simultaneously, it is imperative that all opinions not substantiated by valid data be eliminated.

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Soil Conservation

There is the need for food of desirable quality for man and beast, in order to maintain health and vigor; that means proper distribution and use. America has the "knowhow." Dr. H. H. Bennett, head of national soil conservation, estimates that, at the present rate, all of the basic work for land conservation and rehabilitation will be completed by 1970, if aid is forthcoming. If we are to remain a land of agricultural plenty, now seems the time for a concerted effort to attain these ends. Veterinarians are vitally concerned in the methods and results of this undertaking.—*A. R. Mahan, D.V.M., Marysville, Calif.*

The Animal Protein Factor

A new nutritional factor, commonly referred to as "animal protein factor" (APF) or "chick growth factor" in chicks and "zoöpherin" in rats, has been described. Hens fed a diet deficient in APF, consisting primarily of plant protein as high as 70 per cent soybean meal, produced eggs with low hatchability and chicks with altered viability. On a 30 per cent soybean meal diet, only 66 per cent of the fertile eggs hatched, while hens receiving sardine meal as the only protein supplement produced fertile eggs of 84 per cent hatchability. The lowered hatchability caused by APF-deficient diets was not due to the absence of riboflavin or manganese. Methionine supplements did not correct the detrimental effects of a 70 per cent soybean meal diet. The heat-labile trypsin inhibitor in raw soybean oil meal was not involved because it was destroyed in the heat-treated soybean meal. Supplementation of the hens' diet with excellent sources of APF, *i.e.*, dried cow manure, sardine meal, or dried skimmilk, corrected the deficiency and increased the growth rate of chicks. Good sources of the hatchability factor include rendering-plant meal, packing-plant meal, herring (fish) meal, hen feces by intestinal synthesis, and egg yolks of hens receiving APF in their diet. APF has been shown to be heat stable, moderately water soluble, fat insoluble, and nondialyzable through cellophane.

Female rats fed a purified diet fortified with protein and the known essential vitamins exhibited normal reproduction and lactation. There was, however, a high mortality of the newborn after weaning if they were kept on an APF-deficient diet. A genetic factor involving differences in requirement, storage, or synthesis of the APF factor was incriminated because litters were inclined to survive or to succumb entirely if kept on APF-deficient diets. Crude casein, fish solubles, or liver extract prevented or cured the deficiency in rats.

Recently, an antipernicious anemia factor, vitamin B_{12}, containing phosphorus, nitrogen, cobalt, but no sulfur, with a molecular weight between 1,550 and 1,700 has been crystallized. The crystalline substance produced growth responses in chicks comparable to those obtained by feeding crude sources of the animal protein factor. These chicks received purified basal diets with 40 to 70 per cent soybean meal as the only source of protein. The results showed that vitamin B_{12} and APF may be identical or closely related.—*Borden's Rev. of Nutr. Res., Oct., 1948.*—M. J. SWENSON.

Stock Feed from Pear Waste.—Conversion into feed yeast of the sugars from pear-canning waste is a new, coöperative federal-private industry under development in the State of Washington. A process has been devised to produce feed yeast of high nutritive value by continuous fermentation of the press juice from pear waste, but it has not yet been perfected for commercial application. Factories accumulate about 96,000 tons of pear waste a year, from which nearly 1½ tons of dry yeast could be obtained.

The amino acid, tryptophane, may be the dietary precursor of niacin synthesis in the calf.—*J. Dairy Sci., March, 1948.*

EDITORIAL

Educating Clients Will Help to Eliminate Encroachment

The education of clients by practicing veterinarians can be the most powerful weapon available for combating encroachment upon his particular field. This education must be of a nature that will impress the livestock and pet owner with the need for an accurate diagnosis, specific therapy, and safe, sanitary administration of drugs and biological products.

The practitioner who explains disease problems as clearly and simply as possible, so that the owner can understand, need not fear encroachment. The results achieved by his treatment and the caretaker's nursing will demonstrate to the owner that no peddler of "cure-alls," nor over-the-counter diagnostician, can compete with competent professional service. The owner who has a general understanding of the complexity of pathology, physiology, pharmacology and epizoötiology will not assume that he understands all the symptoms and ailments of animals and will be less likely to gamble against such unfavorable odds with the health of his animals.

The practitioner who does not take time to explain in simple language the need for his detailed examination, to interpret his diagnosis, and point out the effect of the specific treatment administered is inviting encroachment. Why should he expect the client to appreciate the difference between the veterinarian's approach and that of the "remote-control" diagnostician or of the owner himself? Without this explanation the client is likely to believe that he is accomplishing the same purpose at a greatly reduced expense.

Veterinarians fail to understand why livestock owners will gamble with the health of their animals by subjecting them to a barrage of remedies sold by druggists, feed dealers, peddlers, and others. This, of course, is the main source of encroachment.

There are probably several reasons. One that is seldom discussed, but may well be fundamental, is a basic difference in philosophy or understanding. The average farmer's knowledge of physiology and pathology is rudimentary; he does not appreciate the complications that may result from interfering with the precise balance that controls the processes of life. Furthermore, food-producing animals are considered as his personal property and little sentimental value is attached to them.

The average farmer is an ingenious fellow. He learns to rely on his own ability to repair minor troubles that occur; when his tractor breaks down, he tries to fix it himself. Perhaps it is only natural, then, that when an animal becomes sick he "doctors" it himself. This is, at least, what happens if he doesn't realize the importance of an accurate diagnosis and specific treatment. Animals are usually affected with a disease or infection some time before the symptoms are noticed. The caretaker, unless he is a keen observer and an exceptionally good husbandman, fails to recognize this gradual change in condition. Eventually, the disease becomes obvious to him, and he tries home medication for two or three days. When he fails to bring the animal back to health, he calls his veterinarian, and then it is often too late.

A more thorough understanding of the insidiousness of bacterial, parasitic, and virus infections, and a realization of the pathologic changes that follow these invasions, will eliminate much of this regrettable delay. The owner will be more on the alert for evidence of disease and will recognize the necessity of an accurate diagnosis and specific treatment. He will have less confidence in the curative powers of nonspecific remedies.

The proper education of clients, the logical approach to this problem, is the best possible way of bridging the gap that often exists. The veterinarian must remember that his view of home medication and delay in calling for professional help is tempered by a difference in understanding and philosophy. By tactfully explaining this difference and the obstacles he encounters when nonspecific medication and the resultant delay have occurred, he will get better coöperation from his clients. And, at the same time, he will be elevating himself as a veterinarian in the eyes of the people he serves.

CURRENT LITERATURE

ABSTRACTS

Hemolymph Nodes in Sheep and Goats

Because both sheep and goats are slaughtered for human food in many parts of the world, macroscopic and microscopic differences which make possible a distinction of the meats are important. The method of fixing and staining is described as are the distinguishing characters of each type of gland.—[*Z. Erencin: Hemolymph Nodes in Small Ruminants. Am. J. Vet. Res., 9, (July, 1948):291-295.*]

Fowl Cholera in Turkeys

When fowl cholera appeared in a flock of 2,971 turkeys, addition of 0.5 per cent sulfamerazine to the mash reduced the mortality during the period of treatment and for two days longer. The disease then recurred, and subsequently four recurrences of fowl cholera were observed in the same flock. Each time, this rate of medication stopped the losses.—[*J. O. Alberts and Robert Graham: Sulfamerazine in the Treatment of Fowl Cholera in Turkeys. Am. J. Vet. Res., 9, (July, 1948):310-313.*]

Sodium Fluoride Ineffective in Chickens

Sodium fluoride, at nearly effective levels for ascarid elimination is toxic to mature birds and causes them to stop laying. At tolerated levels, it is so ineffective that it is not a practical anthelmintic for chickens.—[*S. A. Edgar: Anthelmintic Activity of Sodium Fluoride in Chickens. Am. J. Vet. Res., 9, (Oct., 1948): 396-398.*]

Intradermal Brucellosis Test

A purified extract of *Brucella abortus* (PEBA) was prepared according to a formula which is described in detail. When injected into rabbits, in 1-cc. doses intravenously, it did not stimulate production of complement-fixing antibodies nor agglutinins—thus eliminating the immediate disadvantage of many similar extracts reported previously.

When injected intradermally into guinea pigs, 0.05-cc. doses elicited conspicuous allergic reactions in Brucella-infected animals, but practically no reaction in normal guinea pigs or those previously exposed to injections of PEBA.

The findings on guinea pigs have been largely confirmed on preliminary field experiments with cattle, the number of reactors disclosed by this method being more than equal to the number of blood reactors. The authors hope that this new diagnostic agent may also serve to determine the relation between the skin sensitivity and tae stage of the infection. If this is accomplished, it will help to differentiate the actively infected animal from the one with a vaccinal response only.—[*H. E. Ottosen and N. Plum: A Nonantigenic Allergic Agent for Intradermal Brucellosis Tests. Am. J. Vet. Res., 10, (Jan., 1949): 5-11.*]

Blood Concentrations of Sulfamethazine

Blood concentrations, considered to have optimum bacteriostatic effectiveness, were attained in calves when sulfamethazine was administered parenterally, orally, and by combinations of the two routes at the rate of 1 gr. per pound of body weight on the first day and ½ gr. per pound on subsequent days in a single daily dose.—[*C. R. Schroeder, Mark Welsh, R. L. Burkhart, and P. H. Langer: Sulfamethazine Blood Concentrations in Calves. Am. J. Vet. Res., 10, (Jan., 1949): 63-65.*]

Mastitis Treatment

As a result of three distinct trials involving some 30 cows, it is concluded that sulfamethazine is ineffective for the treatment of infections of the mammary gland caused by *Staphylococcus aureus, Aerobacter aerogenes,* and *Pseudomonas aeruginosa.*—[*O. W. Schalm, R. A. Bankowski, R. W. Ormsbee, and T. W. Browne: Effect of Sulfamethazine on Certain Infections of the Bovine Mammary Gland. Am. J. Vet. Res., 10, (Jan., 1949):56-62.*]

Infectious Pleuropneumonia of Goats

In 1942, an outbreak of infectious pleuropneumonia of goats occurred in a mountainous district in the vicinity of Lanchow covering an area of about 30 to 40 square miles. Over 90 per cent of the goats died of the disease. Four natural and 23 experimental cases are described. The characteristics of the causative agent, mode of infection, incubation period, symptoms, pathology, and susceptible animals are subjects in this study. It proves without doubt that the disease does exist in northwestern China.—[*F. J. Kwong: Infectious Pleuropneumonia of Goats in the North-west of China. J. of Anim. Husb. and Vet. Med., 6, (July, 1947): 12-17.*]—C.-S.L.

Fowlpest Immunization

Subcutaneous injection of a vaccine prepared from brains and spinal cords of artificially infected birds, and attenuated with glycerin and formalin, produced only a slight degree of immunity. No immunity was produced when vaccine was prepared from livers and spleens and attenuated with glycerin and formalin, or from crop secretion treated with formalin.

Hyperimmune serum, prepared from geese, prolonged the course of the disease, but did not effect a cure.—[*C. T. Hsu, S. M. Chang, S. Y. Yang, and C.-S. Lo: Some Experiments on the Immunization of Fowlpest in Chengtu. Chinese J. of Anim. Husb. and Vet. Sci., 6, (Feb., 1947): 11-14.*]—C.-S. L.

Shipping Specimens in Glycerin

The author studied the bacteriostatic effect of glycerol for controlling surface contamination of lymph nodes sent to laboratories from abbatoirs. The number of specimens that reached the laboratory free from contamination during the summer months was 26 per cent greater if the lymph node was removed with some perinodal fat and placed in 50 per cent glycerin. It was found that glycerin would inhibit the usual surface contaminants but did not cause any apparent decrease in the percentage of specimens from which pathogens could be isolated.—[*T. Björkman: The Influence of Packing Methods, Especially the Use of Glycerol, on the Results of Bacteriological Examination of Lymph Nodes, for Meat Inspection. Skand. Vet.-Tidskr., 38, (Jan., 1948): 1-35.*]—A.G.K.

Lethal Factors in Cattle

Nine malformed calves were born in a herd of about 100 cattle during 1941 and 1942. The calves were all carried to full term and several were born alive. The deformity was contracture of the muscles of the legs and ankylosis. In the 2 cases illustrated by photographs, the contracture is so extreme that the hind limbs appear to be doubled back on each other. The hair is short and frizzy. Besides the 9 abnormal, full-term calves, there were 2 mummified fetuses. The breeding records are not complete, but it is known that a bull purchased in 1937 is the double grandsire of 8 of the calves and possibly of the ninth. It is thought that the deformity is transmitted by a single recessive gene.

Another hereditary defect is characterized by posterior paralysis accompanied in some cases by muscular tremors, blindness, and torticollis. There were 24 calves with this defect, all of them of the Norwegian Red Poll breed. They were all born alive at full term. The fore limbs appeared to be normal, but they all exhibited posterior paralysis. In 18 calves, there was an acute keratitis and ensuing blindness. The cornea seemed to be clear at birth but would become opaque in three days. Avitaminosis A was excluded as the cause. It was found that all of the calves were descended from the bull that was a double grandsire of 8 cases mentioned above. This bull was also grandsire to both parents of the other cases.—[*P. Tuff: Two New Lethal Factors in Cattle. Skand. Vet.-Tidskr., 38, (July, 1948): 379-395.*]—A.G.K.

Spina Bifida in Lambs

A lamb that had posterior paralysis from birth was presented for examination with a history that 3 other lambs on the farm had had a similar defect and a small sore over the sacrum. Examination revealed a small fistula at the root of the tail. This was about 2 mm. in diameter. A sound could be passed anteriorly for a distance of 5 cm. It was found that the three posterior sacral vertebrae were incomplete. The vertebral canal extended only as far as the first sacral vertebra. The spinal cord was normal up to this point but appeared to be replaced by fatty tissue in the defect. The 4 cases were from the same ram, and it is thought that the defect may be hereditary.—[*O. Grini and L. Iverson: Spina Bifida (Rachischisis) in Lambs. Norsk Vet.-Tidsskr., 38, (July, 1948): 252-259.*]—A.G.K.

Mastitis Caused by Escherichia Coli

Bacteriologic studies on 26 cases of acute mastitis in a herd of 42 cattle revealed the cause to be coliform bacilli. The udders became enlarged and painful and the milk was abnormal. In only 4 cases was there systemic involvement as indicated by a rise in temperature. The symptoms of the acute stage lasted for two to ten days but the glands had some degree of persistent firmness. Only 3 of 31 infected quarters became dry. The coliform bacilli could be isolated from the quarters only for two or three days, after which staphylococci could be isolated. Examination of the teat cups of the milking machines revealed a heavy contamination with coliform bacilli. The teats of the cows were very small, and it is thought that hyperemia and inflammation was produced at the tip of the teat. In the older cows, a definite thickening of the tip of the teat was observed. No new cases occurred after proper adjustment of the milking machines and careful disinfection of the apparatus.—[*O. Bratlie: Coli Mastitis. Norsk Vet.-Tidsskr., 60, (July, 1948): 241-252.*]—A.G.K.

Prevention of Bovine Tuberculosis

In order to eradicate tuberculosis in all government owned and coöperative estates in Croatia, a general tuberculin testing program was

carried out. In previous tests, it was found that most satisfactory reactions were obtained by employing the intracutaneous method in the prescapular region, using undiluted tuberculin.

A total of 16,015 cattle were tested, of which 2,022 (12.6%) showed positive, and 764 (4.75%) doubtful reactions. The percentage of reactors on government estates was 26.8 with 7.6 per cent doubtful reactions, while on coöperative farms the test revealed 3.19 per cent reactors and 2.9 per cent doubtful reactions.

Following the test, reacting calves, young, and nonproductive cattle were sacrificed. Pregnant and lactating cows were concentrated on separate farms and were slaughtered at the end of the lactation period.

The loss in coöperative cattle that had to be sacrificed was partially compensated by the government.—[*J. Kucel and B. Tunkl: The Problem of Prevention of Bovine Tuberculosis. Jugoslov. Vet. Glasnik, 9, 1947.*]—E.F.

Therapy of Demodectic Mange with Ultraviolet Radiation

From a total of 11 dogs infected with demodectic mange and treated by means of ultraviolet radiation, 10 dogs were cured completely. The eleventh dog improved significantly and seemed to be cured, but showed a recurrence after three weeks. The treatment was beneficial especially in acute and subacute cases of the disease, but much less so in cases of chronic diffuse pustular lesions.

For the therapy, an ultraviolet lamp 220 volts and 3.7 A. was used. The radiation was applied daily or every other day for the duration of ten to forty minutes and at a distance of from 20 to 40 cm. The treatment lasted for two to six weeks.—[*S. Rapic: Therapy of Demodectic Mange with Ultra-Violet Radiation. Veterinarski Arhiv., 12, (1942:275*]—E. F.

Immunologic Relationship Between Bacillus Erysipelatos and Bacillus Murisepticus

Experiments were conducted to find out whether there is any immunologic relationship between *Bacillus erysipelatos* and *Bacillus murisepticus*. In preliminary tests, the virulence of both strains was standardized by means of passages through pigeons and mice, and the titer of both antierysipelas (AES) and antimurisepticus (AMS) serums was determined.

After a few passages, the virulence of both microörganisms was the same. The AES had 50 to 75 I.U., and the AMS 15 to 20 I.U.

In the main experiment, the immunogenic activity of the AES was tested against *B. erysipelatos* and *B. murisepticus*, as well as that of AMS *vs. B. murisepticus* and *B. erysipelatos*.

The results obtained on 80 experimental pigeons were as follows: AES protected the birds against infection with *B. erysipelatos* and *B. murisepticus*. AMS also protected against infection with *B. murisepticus* and *B. erysipelatis*. The virulence of both cultures was checked in the main experiment by the use of controls.

In order to determine whether the protective activity of the serums is based on the content of specific antibodies, rather than nonspecific proteins, further tests were performed which confirmed the protective activity as strictly specific. A cross agglutination *in statu nascendi* proved also a close relationship of the microörganisms, since both serums agglutinated the heterologous bacilli almost in the same dilutions.

From these results, the author concludes that *B. erysipelatos suis* and *B. murisepticus* are immunologically closely related if not identical.—[*J. Karlovic: Is there Any Immunological Relationship Between B. Erysipelatis and B. Murisepticum? Vet. Arhiv., 12, (1942): 421.*]—E.F.

A Survey of Literature from Holland

The following abstracts from the Tydschrift voor Diergeneeskunde were prepared by Dr. Chas. H. Haasjes.—ED.

Avian Tuberculosis-Like Lesions in a Hog.—Lesions in the liver and lungs of a pig, resembling those found in avian tuberculosis, and from which an acid-fast, rod-shaped bacterium was recovered, was reported by J. Verlinde and J. H. Baker [*72*, (June 1, 1947): 313-318]. The bacteriologic properties classified the organism as an acid-fast saprophyte. Intraperitoneal injections of the culture into guinea pigs resulted in lesions apparently identical with those found in the pig.

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Examination, Collection, and Preservation of Blood.—A procedure is described by C. Postma [*72*, (June 1, 1947): 328-335] for the bacteriologic examination, collection, and preservation of blood and blood plasma (with low bacterial counts) for use in sausage and other products for human consumption.

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Canine Malignant Reticulosis.—A case is reported by J. Verlinde and J. Winser [*72*, (March 1, 1947): 110-113] of malignant reticulosis localized in the skin, regional lymph glands, and peritoneum of a 6-year-old terrier. Clinically and histologically the condition closely resembled malignant reticulosis in man, known as granuloma (Mycosis) fungoides.

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Rabbit Pylorospasms.—Young and, more

often, half to full-grown rabbits suffered from acute digestive disturbances accompanied by acute pylorospasms during the war years. Poor food during this time was considered by A. Klarenbeek [*72*, (Jan. 1, 1947): 1-10] the chief cause. Rabbits afflicted usually died in from one to three days. The condition did not respond to treatment, but from a comparative medical viewpoint it was considered to deserve close attention. [*See* JOURNAL (July, 1947): 54. —ED.]

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Bovine Tuberculosis Control in Denmark.—The campaign against bovine tuberculosis in Denmark, included testing, isolation, progressive compulsory slaughtering of reactors, buying of replacements from tuberculosis-free herds, and provisions for breeding of young stock on a central farm. The campaign is reported by O. Bosgra and F. De Moulin [*72*, (March 1, 1947): 114-124] to have been carried on jointly by the government, dairy coöperatives, and farmers.

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Bovine Brucellosis Control in Denmark.—Denmark's campaign against bovine brucellosis included testing, vaccination, and the use of parturition stalls. O. Bosgra and F. De Moulin [*72*, (March 1, 1947): 125-134] reported the value of vaccination and discredited reports that vaccination promoted the disease. This system extends over all of Denmark and Jutland and 84 per cent of the farms are considered free from infection.

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Fowl Gout.—Two cases of fowl gout, visceral and arthritic, are described by F. Stonebrink [*72*, (March 15, 1947): 164-174]. The term "gout" is derived from human pathology but the analogy of this disease in man and fowls can only be partial, due to the great differences in nitrogen metabolism.

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Hemoglobin Determination.—The laboratory methods for determining the quantitative hemoglobin content of human and animal blood was reviewed by C. Romyn [*72*, (March 15, 1947): 147-162]. The spectrophotometric method gave accurate results, but a photoelectric colorimeter with a mercury lamp and suitable green filter can be used instead. The iron determination, using Wong's procedure, gave accurate results when carried out with precautions.

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Operative Procedure for the Correction of Equine Paraphimosis.—Four cases of paraphimosis (paralysis of the penis) were successfully corrected. After chloroform anesthesia, the animal was placed in dorsal recumbency. The penis was thoroughly washed, disinfected, and replaced in the prepuce. A long dental float was introduced into the prepuce ventral to the penis until the posterior end was visible in the inguinal region and the handle projected slightly from the anterior of the prepuce. Incisions were made on each side of the median raphe through the skin, subcutis, and preputial membrane. Sutures were then placed through the preputial membrane to hold the float solidly *in situ*. When fixed in position by this method, the penis stays in position until recovery.

Swelling, ulcers, or phelgmon of the penis were treated with alum and lead acetate bandages and liquid. In certain cases, bandges may be placed around the body at the loins—H. Ott [*68*, May 15, 1941].

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Swine Erysipelas Immunization. — Three causes of complications following the vaccination of swine against erysipelas are summarized in the report from the Government Serum Institute, Rotterdam, by F. De Moulin [*72*, (May 15, 1947): 271-288], *i.e.*, unsound serums and cultures; mistakes made by the practitioners doing the vaccinating; and incalculable factors. A mistake made by veterinarians was failure to take temperatures before vaccinating, so that sick animals could be excluded. Köbe is reported to have discovered a virus which causes gastroenteritis in pigs, and which is considered by him to be the real cause of erysipelas.

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Listerellosis in a Silver Fox.—Listerella monocytogenes was isolated in pure culture from the organs of a dead Silver Fox by Jacob Jansen and C. W. Pepperkamp [*72*, (June 1, 1947): 319-320].

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Fowl Listerellosis.—Listeria monocytogenes was isolated from the liver of a dead hen by Jacob Jansen and C. W. Pepperkamp [*72*, (July 1, 1947): 389-390]. The organism was morphologically and culturally identical with strains isolated from man, the pig, and a Silver Fox. All strains were pathogenic to the canary.

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Bovine Papillomatosis.—A filterable virus was confirmed as the etiologic agent of papillomatosis in the bovine animal by R. Post and J. I. Terpstra [*72*, (July 1, 1947): 391-395]. They believe it possible to engender an animal hostile to papilloma virus. Recovery usually occurs in the spring when animals are on pasture. One experiment makes it seem possible that "spore elements" may favorably influence the course of the disease.

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Equine Strongyles.—The growth and means of differentiating the sex of equine strongyles is discussed [*72*, (July 15, 1947): 411-421] on the basis of growth phases and their location in the body.

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Tuberculin Reactions in the Horse.—The reliability of tuberculin as a diagnostic agent in

horses is considered to be excellent. Used either as an intracutaneous or conjunctival injection, with equal reliability, J. A. Beyers [*72*, (Aug. 1, 1947): 439-444] considers tuberculin reactions in the horse to be even more specific than in the cow. Why this report is contrary to previous reports of Magnussen, Holt, and Plum, the author was not able to explain.

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Equine Myoglobinuria.—The symptoms and autopsy findings of the first case of equine myoglobinuria in the Netherlands are reported by J. A. Beyers [*72*, (Aug. 1, 1947): 448-452]. The symptoms which began slowly were: mild colic, thickened jaw, paralysis of the pharynx, hemoglobinuria, albuminuria, sediment in the urine of epithelioid cells, stiffness, atrophy of the gluteus muscles, slight elevation of the temperature, quickened pulse, hyperleucocytosis, Hyperbilirubinanemia. On autopsy, typical degeneration of the masseter and gluteus muscles and the heart and liver, along with enteritis of the cecum and colon, was observed.

Abstracts from the Flemish Veterinary Journal

The following abstracts from Vlaamsch Diergeneeskundig Tydschrift were prepared by Dr. Chas. H. Haasjes.—ED.

Control of Trichomoniasis in Bulls.—The diagnosis of trichomonad infection in bulls and the treatment of infected bulls by chloramine-lugol disinfection of the penis and sac under epidural anesthesia are reported by Dr. Vanderplasche [*15*, Jan. and Feb., 1946]. The prepuce of breeding bulls in infected areas are disinfected after each copulation. Because of the success of the treatment and of the prevention of the spread of the disease, slaughter is not recommended if the bull is a valuable breeding animal.

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Laminitis and Histamine.—Acute equine laminitis is assumed to be caused by the action of histamine by W. Oyaert [*16*, (Jan., 1947): 1-6]. He speculates as to where the histamine is produced. The work of Mintchev, who found histamine produced by coli-typhoid organisms, is cited. Mintchev also observed that horses suffering from periodic ophthalmia exhibited laminitis symptoms which he succeeded in duplicating by the injection of histamine intra-arterially. The reports from France of successful treatment of laminitis with antihistamines is cited as additional evidence.

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*Diseases of Volierebirds**—An abstract of a booklet, which is the third of a set written about diseases of birds by L. Guerden [*16*, (Jan., 1947): 16], deals with diets, accidents, and contagious diseases.

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Histochemic Nerve Study.—By the use of a histochemical reaction, Marcel Sebruyns [*16*, (Feb., 1947): 17-25] reports the discovery of an intraglandular network of sympathetic nerves which do not penetrate the cells.

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Trichuridosis in Cattle.—Four heifers infected with *Trichuris affinis* (ovis) were described. E. F. M. Maenhout [*16*, (July and Aug.,1947): 82-86] insists that this parasite should not be considered as commensal but as a real parasite. Following treatment, clinical recovery was achieved, even though a small number of *Trichuris* eggs were still found in the feces.

*A voliere is a large bird cage, from 10 to 20 ft. in diameter, in which wealthy Europeans keep many varieties of small birds as a hobby.

BOOKS AND REPORTS

The Renal Origin of Hypertension

This book is a summary of experimental work covering more than twenty years in the production of experimental renal hypertension in animals, the pathology of the condition, and its treatment.

Although the experimental work was conducted on animals, of which many are definitely susceptible to the condition, the book is of limited interest to veterinarians, other than those working in this field of pathology, because hypertension is a problem which few veterinarians are ever asked to treat.—[*The Renal Origin of Hypertension. By Harry Goldblatt, M.D. Cloth. 128 pages. Illustrated. Charles C. Thomas, 301 East Lawrence Ave., Springfield, Ill. 1948. Price $2.75.*]

Surgical Manual for Veterinary Students

Dr. W. F. Guard, a member of the veterinary faculty at The Ohio State University, adds to the literature a manual on the surgical techniques covering the principal operations. The author is a teacher long devoted to that branch of learning, and an associate editor on the JOURNAL'S staff. A review of the book must, therefore, be taken as a well-meant family discussion.

Dr. Guard has compiled material delightful to read and crammed with information acquired in the line of duty—the only reliable source of surgical skill. The stated purpose of the manual is "to furnish a rather complete description of surgical procedures they [the students] are expected to perform before receiving credit in surgery." The techniques of this book, chosen for teaching purposes, and their descriptions constitute a notable addition to our surgical literature.

Veterinary writers, especially surgeons, of

every period have left the impression (on printed pages) that nothing worth while was started until they came upon the scene, while protesting, as Guard does: "The importance of history cannot be overemphasized." This stems from the fact that surgical procedures have not been standardized, and general accord ends with the over-all fundamentals. In respect to the innermost details, customs are entirely different.

For a manual which will be used by students while they are being grounded in the surgical art, the book leaves some things to be desired. It leaps all the way from the early celebrities of the biological sciences (Pasteur, Kitasato Metchnikoff) to World War I for workers of note in the surgical field. Students should have a more chronological course in surgery, especially since what we do now is what the interim authors did, and taught, and demonstrated; and since more was written on the science and art of animal surgery during the twenty-five years overlapping the coming of the twentieth century than was written before or has been written since.

As a student manual, the advisability of discussing antisepsis before asepsis is also open to question. And finally, because the author was preparing a text for student use and because he is an associate editor of the JOURNAL, it is regrettable that the text was not more carefully prepared as regards misspelled words, ungrammatical capitalization, lack of uniformity in punctuation and abbreviation, and minor physical faults.

Good usage has a far-reaching effect—far more than meets the eye—on the people's appraisal of our branch of learning. Poor usage detracts from acceptance of a book and is particularly regrettable in an instance of this kind, when the techniques chosen and their descriptions constitute a notable addition to our surgical literature. Almost all of the procedures of a general practice are included and the descriptions have the earmark of having been written with the scalpel in hand.

The illustrations, many of which are reproductions of actual specimens and views, make up an amazing assemblage of surgical studies, the equal of which we have never before seen in books.—[*Surgical Technics for Veterinary Students. By W. F. Guard. 179 pages of offset printing; ring binder; 8½ by 11 inches. Profusely illustrated. Lithoprinted by Edwards Brothers, Inc., Ann Arbor, Mich. 1948. Price $5.00.*]

Experimental Immunochemistry

The authors have assembled the information in this interesting and expanding field in such a way that the student can follow the progress of development along any line in which specific knowledge of immunity may be desired, and yet have presented this in such a way that the investigator engaged in identifying a substance from a field sample can bring all of the current information to bear on the problem with a minimum of effort.

Part I is a study of the antigens and antibodies, their chemical structures, and the manner in which each is important in immunology. Part II deals with the methods of estimation of antigens, particularly the application of quantitative immunochemical methods to actual problems. Part III provides the specific information needed by a worker in conducting the various tests upon which immunochemistry rests. Part IV presents the details for preparing many of the individual proteins, enzymes, polysaccharides, and related substances which are the stock-in-trade of workers in this field. The appendix discusses centrifuges, colorimeters, the cleaning and calibration of glassware, and injection of animals for immunization schedules.

This is a book for the laboratory or research worker and the student of immunology, but it is too technical for use by the practicing veterinarian in his routine problems of diagnosis and immunization.—[*Experimental Immunochemistry. By E. A. Kabat, Ph.D., and M. M. Mayer, Ph.D. Cloth. 575 pages. 80 figures. 80 tables. Charles C. Thomas, 301 East Lawrence Ave., Springfield, Ill. 1948. Price $8.75.*]

The Chemistry of Penicillin

This is the final report of an investigation in which American and British chemists collaborated under the joint sponsorship of the Office of Scientific Research and Development (OSRD), Washington, D. C., and the Medical Research Council, London.

A continuous reporting service was developed during World War II, and was maintained upon conclusion of the war by the 38 laboratories contributing to this work. The book is a detailed report of the chemical findings (by 66 authors) which permitted one laboratory to inform all others of reactions which took place in the far-flung battle to improve the yield of penicillin, so that it might become available in quantities which would permit its use in all Allied countries, and at a reasonable price.

The chemical procedures and formulas are so complex that they can be read and understood only by the worker who specializes in this field. On the shelf of the practicing veterinarian, this text would be a dust-gatherer, but in the research and commercial fields it should instill a deep respect, if not downright awe, at the amount of information which was uncovered and the meticulous manner in which it was relayed to workers in the remaining contributing laboratories.—[*The Chemistry of Penicillin. Edited by Hans T. Clarke, John R. Johnson, and Sir Robert Robinson. Cloth. 1,094 pages. Princeton University Press, Princeton, N. J. 1949. Price $36.00.*]

THE NEWS

Detroit Meeting—July 11-14, 1949

Headquarters Hotels—The Statler and the Book-Cadillac

Expect Registration to Be Largest in AVMA History

Attendance at the eighty-sixth annual convention in Detroit, July 11-14, 1949, is expected to break all previous records.

Continuing growth of the Association and widespread interest in its activities, coupled with the fact that the "motor city" centers on the area of heaviest veterinary population in North America, make it almost certain that the record-breaking Cincinnati (1947) registration of 2,226 will be exceeded. The attendance of 2,111 at San Francisco in 1948 was the second largest in Association history.

Circled within a 600-mi. radius from Detroit are approximately 8,000 United States and Canadian veterinarians, a substantial percentage of whom are active in AVMA affairs. This 600-mi. radius extends to Philadelphia, New York, Baltimore, and Washington on the east; to Richmond, Knoxville, and Nashville on the southeast; to St. Louis on the southwest; nearly to Des Moines, Minneapolis, and St. Paul on the west and northwest, and to several major Canadian cities.

Washington Blvd., Detroit, showing the Book-Cadillac hotel in the center background and the Statler hotel in the right foreground.

Ample and excellent hotel accommodations have been allotted by six of Detroit's leading hotels, including the Statler and Book-Cadillac, which will be joint convention headquarters. However, June 10 is the deadline for reserving rooms in this quota, and those who have not made reservations by that time may find it difficult to get choice accommodations. Members should use the blank form on page 43 of this issue in requesting rooms for themselves, their families, and guests. Attention also is invited to the program schedule in the March, 1949, JOURNAL, page 174, which will help members to plan their arrival and make hotel reservations accordingly.

TRAVEL ROUTES

Detroit can be reached by automobile, rail, air, bus, and Great Lakes steamer. By rail, the city is fifteen hours or less from Boston, Philadelphia, New York, Baltimore, Washington, and St. Louis; about half that time from Indianapolis, Cincinnati, Pittsburgh, and Milwaukee.

The approximate driving mileage from various points is:

Auto Mileage to Detroit from Various Cities

City	*Miles*	*City*	*Miles*
Atlanta	737	Chicago	280
Boston	749	Milwaukee	375
Philadelphia	580	Indianapolis	287
New York	652	St. Louis	522
Baltimore	516	Kansas City	758
Washington	531	Minneapolis	697
Pittsburgh	288	Louisville	389
Buffalo	245	Toronto	234
Cleveland	172	New Orleans	1,099
		Cincinnati	257

Persons desiring to travel all or part of the way by lake steamer may obtain information from the following sources: Chicago, Duluth, and Georgian Bay Lines; Cleveland and Buffalo Transit Co.; Detroit and Cleveland Navigation Co.; and Northern Navigation Co.; all of which have offices in Detroit, Chicago, and other principal cities on the Great Lakes.

DETROIT'S CLIMATE AND SURROUNDINGS

This city of 1,825,000 people is situated on the Detroit River, across from Windsor, Ontario, to which it is connected by the Ambas-

sador Bridge and the Detroit-Windsor Fleetway Tunnel. It borders on Lake Erie and Lake St. Clair and is just a short distance below the southern tip of Lake Huron. Its official average temperature in July is 73.1 degrees. Meeting rooms at the headquarters hotels are air-conditioned.

Besides being a springboard to many famous vacationlands, Detroit has abundant attractions for convention-goers. Belle Isle, in the middle of the Detroit River, is a thousand-acre island park with sports fields and bathing beaches. It also has a zoo and a 2-mi. miniature railway which afford excellent entertainment for the youngsters. For music lovers, twilight summer concerts are presented in a spacious open-air stadium by the Detroit Symphony Orchestra. There are many good places to eat and numerous night clubs. Sightseeing opportunities include afternoon and evening boat trips to Bob-Lo Island and Put-In Bay, the downtown skyscraper section, attractive shops and department stores, trips along the exclusive boulevarded shore, and visits to automobile manufacturing plants and to the Ford Museum.

Highlights of the Program to Be Presented at Detroit

At the 86th annual meeting of the AVMA in Detroit, Prof. J. B. Hays, Michigan State College, will conduct an evening meeting on Tuesday, July 12. The meeting will begin with "Phunology," which Professor Hays does in his inimitable manner that has been acclaimed "tops in fun" by all who have heard him. The women should plan to attend this session, as well as the opening and closing sessions of the convention, as the subjects to be discussed will be of such a nature that they will enjoy them and will be able to use the facts presented.

Also on Tuesday evening, a panel or symposium on "As Others See Us," will be presented, in which Professor Hays will act as moderator, assisted by representatives from other fields. They will tell of their experiences with veterinarians, and especially of the problems which coöperative efforts have solved. On this panel will be such nationally known figures as Miss Sarah Van Hoosen Jones, a livestock owner; Mr. Sam Guard, a livestock editor; Prof. C. S. Rhode, extension animal husbandryman; Prof. C. F. Huffman, nutritionist; Mr. Louis Hall, county agricultural agent; and a vocational agricultural teacher still to be selected.

In the closing session on Thursday morning, to which the women are also invited, Chief B. T. Simms, of the Bureau of Animal Industry, will summarize veterinary problems at the national level; Lieut. Col. F. A. Todd, will discuss the methods used, and the amount of help extended by Veterinary Corps officers toward the rehabilitation of livestock production in war-torn countries; Dr. H. J. Stafseth will outline the twenty years of progress by veterinarians in the poultry field; Dr. Alexander Zeissig will present a new and novel plan for organizing a rabies eradication program which literally has had previous audiences rocking in their seats; and other speakers of equal calibre will be scheduled. The section programs also will have their quota of talent.

The Section on Small Animals will be highlighted by a television broadcast on fracture fixation from a Detroit veterinary hospital to the meeting room and also over the regular broadcast network. The other portions of the program, will be on a comparable plane.

The Section on Poultry will provide practical information for busy veterinarians on nutritional, parasitic, and infectious diseases of chickens and turkeys.

The officers of the Section on Surgery and Obstetrics have arranged a program on surgical procedures and obstetrical helps which practitioners can use whether they work with cattle, horses, or pigs, and some which apply to all species.

The Section on Research will present reports

Detroit skyline as seen from Canada, with the Detroit River in the foreground.

on the newest findings in a wide variety of fields, which will help to solve the practice problems in the several species of farm animals and household pets.

Papers to be delivered in the Section on Public Health will discuss such general problems as state meat and dairy inspection programs and a reporting system for diseases of animals. They will also deal with some specific diseases and will again present a panel similar to those which have been instructive and interesting in preceding years.

The Section on General Practice will be highlighted with discussions of some of the newer aids to practice—the airplane, the radiophone, and the car-to-office telephone. This section program will also include discussions of practice problems from widely scattered geographical locations as they apply to all species of animals.

The Program Committee sincerely believes that it is presenting one of the most comprehensive programs and some of the most talented speakers that any AVMA convention has offered.

Program of International Veterinary Congress and the United States Reporters

Following is an outline of the General and Sectional Meeting programs of the 14th International Veterinary Congress in London, Aug. 8-13, 1949, and the names of reporters and subjects from the United States selected by the Organizing Committee in London. "The World Food Situation," the theme of the Congress, will be the principal topic at the general sessions to be discussed by outstanding men from all over the world.

14th International Veterinary Congress Program

GENERAL MEETINGS

1) THE WORLD FOOD SITUATION.

2) THE VETERINARY PROFESSION'S CONTRIBUTION TO THE WORLD'S MEAT SUPPLY.

3) THE VETERINARY PROFESSION'S CONTRIBUTION TO THE WORLD'S MILK SUPPLY.

4) THE VETERINARY PROFESSION'S CONTRIBUTION TO THE WORLD'S POULTRY AND EGG SUPPLY.—Dr. F. R. Beaudette, Rutgers University, New Brunswick, N. J.

5) THE VETERINARIAN AND THE BREEDING AND REARING OF ANIMALS.

6) VETERINARY EDUCATION AND ITS APPLICATION TO WORLD PROBLEMS.

SECTIONAL MEETINGS

Eight main topics and more than 30 subtopics are listed for discussion. Because of lack of space, there are listed below only the main topics and the titles under each which will be discussed by United States reporters.

1) ANIMAL HEALTH AND ANIMAL PARASITES

a) Helminth Diseases and Therapeutics.—Dr. E. W. Price, Bureau of Animal Industry, Washington, D. C.

2) ANIMAL HEALTH AND BACTERIA

a) Bovine Mastitis: Recent Advances in Transmission, Diagnosis, and Bacteriology.—Dr. R. B. Little, Rockefeller Institute, Princeton, N. J.

b) Vaccination Against Bovine Brucellosis.—Dr. C. K. Mingle, Bureau of Animal Industry, Washington, D. C.

c) The Control of Bovine Tuberculosis in the United States.—Dr. B. T. Simms, Bureau of Animal Industry, Washington, D. C.

d) Salmonellosis: A Veterinary Public Health Problem.—Dr. W. R. Hinshaw, University of California, Berkeley.

3) ANIMAL HEALTH AND VIRUSES

a) Equine Encephalomyelitis.—Dr. H. W. Schoening, Bureau of Animal Industry, Washington, D. C.

b) Newcastle Disease (Avian Pneumoencephalitis) in the United States.—Dr. J. R. Beach, University of California, Berkeley.

c) Swine Fever (Hog Cholera).—Dr. J. D. Ray, Corn States Serum Company, Omaha, Neb.

d) Rabies.—Dr. W. A. Hagan, New York State Veterinary College, Ithaca, N. Y.

4) PHYSIOLOGY AND ANIMAL HEALTH

a) Physiologic Aspects of Therapy for Acetonemia in Ruminants.—Dr. Jesse Sampson, University of Illinois, Urbana.

5) HUSBANDRY AND ANIMAL HEALTH

a) Plants as Animal Foodstuffs.—Dr. G. H. Hart, University of California, Berkeley.

6) ANIMAL HEALTH AND SURGERY

a) Anesthesia.—Dr. C. F. Schlotthauer, Mayo Foundation, Rochester, Minn.

7) ANIMAL HEALTH IN RELATION TO PUBLIC HEALTH

a) Control of Animal Products Intended for Human Consumption.—Brig. Gen. J. A. McCallam, Veterinary Division, Office of the Surgeon General, Washington, D. C.

One day is to be devoted to clinical subjects of special interest to small-animal practitioners; this program will be in conjunction with the National Veterinary Medical Association of Great Britain and Ireland, which is also meeting in London, August 12 to 15.

Veterinarians in the United States who are interested in obtaining membership in the 14th International Veterinary Congress are urged to obtain an application form from the AVMA office, 600 S. Michigan Ave., Chicago 5, Ill., or from the nearest veterinary college, veterinary science department, livestock sanitary official, or state association (*see* March JOURNAL, p. 175). The fee for regular members is $16, student members, $6. Whether or not it is planned to attend the London Congress, the printed report will be worth the price of membership to many veterinarians.

Major T. C. Jones Appointed to Nomenclature Committee

President L. M. Hurt has appointed Major T. C. Jones, V.C., Army Institute of Pathology, Washington, D.C., to the Special Committee on Nomenclature of Diseases at the request of Chairman H. C. H. Kernkamp.

This committee is setting up standard procedures for naming and diagnosing diseases of animals. The material will be published at an early date as one of the basic preliminary steps to establishing a uniform system of reporting morbidity and mortality in livestock.

Special Committee on Quarantine Regulations Appointed

President L. M. Hurt has recently appointed a special committee to act in an advisory capacity to the U.S. Public Health Service to

formulate recommendations for quarantine regulations on psittacine birds and other zoölogical park animals, with special reference to diseases of these creatures which are transmissible to man. The need for the Committee was recently expressed by the Public Health Service.

The Committee personnel are: Dr. Leonard J. Goss, *chairman*, New York Zoölogical Park; Dr. I. E. Altman, Brooklyn, N. Y.; Dr. S. O. Fladness, Washington, D.C. (representing the Bureau of Animal Industry); Dr. C. R. Schroeder, Pearl River, N. Y.; and Dr. James H. Steele, Atlanta, Ga. (representing the Public Health Service).

AVMA Research Fellows

W. S. Bailey was born March 2, 1921. He was educated at Alabama Polytechnic Institute (D.V.M. 1942 and M.S. 1946). He served as graduate assistant in the Department of Bacteriology and Pathology at API in 1942, was promoted to instructor the following year, to assistant professor in 1945, and to associate professor in 1947. In September, 1948, he entered the School of Hygiene and Public Health, Johns Hopkins University, under his AVMA fellowship.*

Dr. Wilford S. Bailey

His first year is being devoted to absolving the formal courses required in the major field of parasitology and the minor field of bacteriology.

The research problem selected will consist of studies on the host-parasite relationships of *Hymenolepis nana* var. *fraterna*, with special reference to comparisons between the direct and indirect life cycles. This parasite is especially suited for use in studying the host-parasite relationships, being peculiar among the tapeworms in that it develops directly, but may employ an intermediate host. Since this is a parasite of the rat and mouse, larger numbers of animals can be employed in the studies than would be possible with a tapeworm infective only on the larger animals. The basic facts can then be verified or modified by using limited numbers of these larger animals.

*This is the seventh of a series which was started in July, 1948 (*see* JOURNAL, July, 1948: 87).

Committee of Practitioners Consider Brucellosis Programs

The agitation to employ nonveterinary technicians in the brucellosis control program can best be combated by having practitioners take a more active part in these programs. To get the practitioner's viewpoint, President L. M. Hurt, appointed a special committee of practitioners to discuss the changes necessary in the program to get more practitioner participation.

The committee consisting of Drs. W. Wisnicky (Wis.); A. M. Orum (Ill.); R. J. Tobola (Minn.); T. L. Steenerson (Ind.); A. E. Erickson (Mich.); C. C. Franks (Iowa); and O. Norling-Christensen (Ill.), AVMA Executive Board member, met in the AVMA office during the morning of January 31. Drs. Hardenbergh, Klussendorf, and Van Houweling of the AVMA staff sat in with the committee.

Each member outlined the program for his state, emphasizing the features practitioners found desirable to permit participation in the disease eradication program with a minimum of interference with regular practice. Also discussed were those features which discourage participation because of the difficulty in integrating the program with practice.

There was a great deal of variation between states, but certain features of each program were considered desirable by those present. Based on these opinions, the following recommendations were drawn up:

1) A stabilized program that will give every possible assurance of eradicating the disease should be adopted.

2) Indemnities should be paid for reactor animals that are sent to slaughter.

3) Payment to practitioners should be on a per head and per call basis.

4) Laboratory reports should go to practitioners for the interpretation of results.

5) The number of forms and copies required should be reduced.

6) Extension veterinarians and other extension workers must emphasize to the farmer the values of good herd management and sanitation.

7) Practitioners must likewise explain the value of good herd management and sanitation to coöperators.

8) Provision should be made whereby cooperators could select the veterinarian they prefer to do their work, rather than assignin: a certain specified area to one veterinarian.

The following points the practitioners considered should not become part of the program and recommended that:

1) Lay technicians should not be used to conduct diagnostic tests, as it will discourage further practitioner coöperation and because it is believed the number of veterinarians available during the next few years would be sufficient to carry out the program.

2) The requirement of prevaccinational testing should be abolished in all states.

3) Agreements of coöperation between the federal and state governments and the farmer should not be used unless they can be adequately enforced.

The committee met in the afternoon with Drs. L. M. Hurt, A. K. Kuttler, and B. T. Simms, chief, Bureau of Animal Industry. Dr. Wisnicky had been chosen by the group that met in the morning to act as their spokesman. He presented the recommendations outlined above.

After his presentation, Dr. Simms discussed them one at a time. In general, he reported that practically every recommendation they had made had been considered by the Bureau; and although some recommendations had merit, there were also some disadvantages that had to be considered. He assured the group that the BAI was unalterably opposed to taking animal disease control out of the hands of the profession. However, they are also committed to eradicate the disease. The question that they face is, "What is professional work and what is technical work?" He reported that lay assistants are working on the control program in Maine, North Dakota, Colorado, and Alabama, with the approval of the respective state veterinary medical associations.

The meeting adjourned upon a note of harmony, the committee members feeling that formulation of these basic statements had served to unify their own thinking and to solidify the voice of the practitioner in this problem. It is hoped that Dr. Simms, as chief of the BAI, may use this concise statement of desirable and objectionable points in the present program as a basis for modification which will permit a greater number of practicing veterinarians to engage in brucellosis eradication more extensively and more effectively. It is realized that certain phases of the program are dictated by bureaus of the government other than the BAI, but it is hoped that these bureaus will realize that they can serve the livestock industry more effectively if they can encourage wider participation by practicing veterinarians in livestock disease-eradication programs.

It was agreed that meetings of this type are valuable and that after publication of this report, it should be supplied to federal and state regulatory officials. Since many of the matters involve state regulations, they will have to be considered further on the state level. The Committee agreed that a similar conference should be held within each state, and it is hoped that this meeting will set the pattern for future state meetings.

Humane Act Award

The AVMA annually makes its Humane Act Award to a boy or girl not more than 18 years old, who has outstandingly befriended an animal or animals. A study project, a rescue, or some specific work in behalf of animals are some of the qualifying conditions.

In addition to a handsome, framed certificate, the AVMA is offering a $100 U.S. savings bond to the one who qualifies for this award. Last year, Richard Swank of Mentor, Ohio, was the winner for his efforts in behalf of an unfortunate puppy.

The sixth Humane Act Award Committee welcomes all possible entries, and anyone may make nominations. A description of the circumstances should accompany the nomination. Entries should be addressed to Dr. S. T. Michael, chairman, Humane Act Award Committee, 2500 Sixteenth St., San Francisco 3, Calif. Nominations close May 1, 1949.

Veterinarians Honored

In the nation-wide poll by the Gaines Dog Research Center to determine the outstanding personalities in various branches of American dog-

Dr. W. A. Young, honored with a "Fido" award.

dom in 1948, Dr. W. A. Hagan, dean of the New York State Veterinary College, Cornell University, Ithaca, was named veterinarian of the year for his inspirational leadership in the vet-

—*Gaines Dog Research Center*

Dean W. A. Hagan, shown with his "Fido" award.

erinary profession and his constant endeavors to increase research activities. Dr. W. A. Young, managing director of The Anti-Cruelty Society, Chicago, was voted humane worker of the year

for his devotion to the humane aspects of dog care and for his unselfish service to dogs and other animals.

Regional Veterinary Educational Experiment

Governors of 13 southeastern states, and 200 educators from the same region, took a real step toward solving the problem of providing regional facilities for the education of professional students. At a joint meeting, Dec. 12-13, 1948, they voted to request their respective state legislatures to appropriate $1,736,000 to finance regional schools so that adequate facilities could be provided for students in medicine, veterinary medicine, dentistry, and some other lines of graduate work.

The suggested veterinary program calls for $500,000 to be spent by the 13 states at four veterinary schools: Alabama Polytechnic Institute, University of Georgia, Oklahoma A. & M. College, and Tuskegee Institute. Each of these schools would be assigned a definite quota of students. Thus, Alabama would enroll 35 students from Alabama and 40 additional students from Florida, Mississippi, South Carolina, and Tennessee. Oklahoma would enroll 30 students from its own state and 10 from the adjoining states of Arkansas and Louisiana. Georgia's quota would be 20 students from within the state and 30 from the surrounding states of Maryland, North Carolina, West Virginia, and Virginia. Tuskegee Institute would enroll nine Negroes from Alabama, and 41 additional Negroes from the remaining 12 southeastern states.

In this way, the states which would not be justified in establishing their own veterinary colleges would be assured at least a minimum number of graduates annually. Coöperatively, the 12 or 15 southeastern states could support three or four veterinary schools, adequately equipped and well staffed as the increased enrollment provided by this plan would justify.

Similar programs, each using and improving the existing facilities, would be worked out for the remaining professional and graduate fields.

Veterinarian Trainee Civil Service Appointments

Veterinary students who have completed two or three years of their professional training in an accredited college are eligible for civil service appointments at the SP-5 or SP-6 grade. Applications for the examination required for these appointments were solicited by seven regional civil service boards in the United States. The board at Milwaukee, Wis., which was one of the seven, received 179 applications for the examination. The Bureau of Animal Industry plans to use approximately 25 trainees in the six-state area covered by this board.

The entrance salary level for the SP-5 is $2,724 annually, with annual increases up to $3,175. The minimum salary for the SP-6 is $2,974, with a maximum of $3,727 annually. The duties of the trainees will be sub-professional work under professional guidance. They can be employed for on-the-job training during school vacation periods and scholastic training in appropriate subject matter during the regular session at a designated college. While attending college, they will not receive a salary and will be required to pay their own expenses. After a period of on-the-job training, they may obtain leave to return to college and, when they have completed further academic study, they may return to duty at the same grade or be promoted to a higher grade. After graduation, they may be promoted to full-time professional positions with a P-2 rating.

Appointees can not remain in a position for more than eighteen months without securing additional scholastic training. After eighteen months, they must be promoted to the next higher level of trainee position, to a regular professional position, or be reassigned to a nontrainee position or be released.

Executive Board Elections in Progress in Districts IV and X

Nominating ballots were mailed February 15 to members in District IV (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, Cuba, Puerto Rico, South America, and the West Indies) and District X (Michigan and Ohio). The terms of the incumbents—Dr. R. E. Carlisle, Camilla, Ga. (District IV), and Dr. W. R. Krill, Columbus, Ohio (District X)—expire at the conclusion of the annual meeting in Detroit next July. The nominating polls close on April 15 and names of the five men receiving the highest number of votes in each district will be listed on ballots to be mailed about April 20.

Veterinary-Feed Industry Relations

Eighty per cent of the AVMA members replying to a poll said their relations with feed dealers were good. Only two per cent said their relations were bad and they referred specifically to "peddlers." This question was one of nine asked 300 AVMA members in Nebraska, Iowa, Colorado, Kansas, Missouri, Oklahoma, Arkansas, and Texas. The answers to the questionnaire were the bases for a talk to the Agricultural Forum of the Midwest Feed Manufacturer's Association in Kansas City, Mo., on February 17 and 18, which was presented by Dr. C. D. Van Houweling, of the AVMA staff.

Ninety-three per cent of those who replied to the poll said they were personally acquainted with the feed dealers in their area. Only two per cent said they would not be willing to co operate with feed company representatives in the holding of educational meetings for farmers on the subjects of correct feeding and disease control. In reply to the question, "If there is friction (with feed dealers), what is the primary cause?", 50 per cent said the sale of drugs and treatment of animals by feed salesmen were the basic causes. Fifteen per cent thought the misrepresentation of feed was the basic cause of differences that arose, and 28 per cent thought the friction was the result of misunderstanding.

When asked, "How would you suggest im-

proving relations between veterinarians and feed dealers?", 50 per cent thought it could best be done by meeting together and becoming better acquainted. Another 30 per cent thought relations could be improved by the feed dealers and the veterinarians staying in their respective fields. Nine and 11 per cent, respectively, thought relations would be better if the quality of feeds was improved, and the farmer were better educated.

The replies indicated that only about 44 per cent of the clients of the members who replied to the questionnaire are feeding balanced rations. Eighty-nine per cent said they often encountered nutritional deficiencies in their practice. The deficiencies most often seen were: minerals, 42 per cent; vitamins, 29 per cent; proteins, 18 per cent; carbohydrates, 4 per cent; and all others 10 per cent.

The report was received by the feed manufacturers with a great deal of interest. The response to the questionnaire was most gratifying.

John L. Tyler, D.V.S., M.D.
1870-1948

The death of John Lou Tyler (CVC '91-Barnes M. Col., '93) on Dec. 24, 1948, removed from the ranks of clinical and organized veterinary medicine an outstanding figure of many years. The loss was from the not-so-numerous group of practitioners who give time and effort to the advancement of their profession through a long life, without thought of personal reward, and who have unsought renown thrust upon them because of the merit of their leadership. Dr. Tyler was a great man in the sense of excelling as a convincing speaker who swayed his audience without verbosity when he rose in offense or defense of an issue. He will be known for that quality in the annals of veterinary history. It would require pages to tell what he did for the development of the veterinary profession in California and the dignity he brought over the mountains to the national meetings as visitor or member since the turn of the century. Although not the founder of veterinary organizations in California, his name was connected with the pioneers in the late 1890's, namely: Fox, Spencer, Longley, Archibald, Whittlesey, McKenna, Straif, and others of the old crowd, and he was a life member of both the Southern California and the California State associations and a member of the AVMA since 1915. The key positions he held in these organizations were numerous. They include the presidencies, secretaryships, chairmanships, and delegations which no steadfast worker can escape. Though none of these alone could have glorified him in the sense of an international figure, together, they did just that for the departed Tyler.

Dr. John L. Tyler

He was born on a farm in Iroquois County, Illinois, Feb. 19, 1870; he married Miss Lou M. Pick on July 29, 1890, whom he survived. Graduated from the Chicago Veterinary College in 1891 and from Barnes Medical College of St. Louis in 1893, he practiced veterinary medicine for a short time at Chebanse, Ill., and human medicine for a still shorter time at Kentland, Ind. Dr. Tyler moved with wife and family to southern California in the middle 1890's; practiced veterinary medicine at Pomona, Long Beach, and Baldwin Park; retired from practice to enter the state meat inspection service, and was retired from that position for superannuation at the age of 70. He is survived by his daughter, Mrs. M. L. Cheney.

AAHA Meeting

Elaborate plans are almost complete for the 16th meeting of the American Animal Hospital Association to be held at the Edgewater Beach Hotel, Chicago, May 5 to 7, 1949. Three days of scientific papers are scheduled, dealing with the practical aspects of the treatment of small animals. An array of some of the nation's best veterinary and medical talent is scheduled to appear. The AAHA extends a cordial invitation to all veterinarians interested in this branch of veterinary medicine to attend these sessions and to take part in the discussions.

s/WAYNE H. RISER, *Executive Secretary.*

STUDENT CHAPTER ACTIVITIES

Cornell Chapter History.—On Oct. 1, 1897, 14 students organized the first veterinary society at Cornell University. Known as the Comparative Medical Society, this group functioned until 1909. The minutes of the Society are now a part of the rare book collection of the Flower Veterinary Library.

For thirty years, there was no permanent student organization at the Veterinary College. In May, 1939, Dr. Cassius Way helped to organize the Cornell University Student Chapter of the AVMA. The aims of the Chapter are to stimulate interest in organizational work and to expand the fields of interest in veterinary medicine.

Meetings are held bi-weekly during the college year, with programs featuring speakers selected from the veterinary profession and related fields, motion pictures, panel discussions, and illustrated lectures. The Chapter also sponsors smokers, orientation tours for first year students, and other social activities. This year, the Chapter hopes to enter teams in intramural athletic competition and to start a Chapter publication.

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Iowa Chapter.—At the March 9, 1949, meeting, Dr. Harold Gunderson spoke on "Controlling Farm Insects."

s/Roland C. Bunge, *Secretary.*

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Missouri Chapter.—The Veterinary Club of the University of Missouri elected the following officers at the Feb. 14, 1949, meeting: Paul Zollman, *president-elect;* Willis Boucher, *vice-president;* E. J. Krautmann, *secretary;* and Hersel H. Robertson, *treasurer.*

s/E. J. Krautmann, *Secretary.*

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OSU Student Receives Army Heroism Award.—Edwin L. Davis, a sophomore in The Ohio State University College of Veterinary Medicine, was awarded a Silver Star medal for heroism in combat on Iwo Jima in March, 1945. He was commended for obtaining ammunition needed by his assault platoon when it was held up by an enemy strong point. Although wounded, Davis made several trips under heavy machine gun and mortar fire, enabling his platoon to accomplish its mission. He was a field musician, first class, with company F, 2nd Battalion, 23rd Marines in the 4th Marine Division.

WOMEN'S AUXILIARY

Louisiana Auxiliary.—At the eighteenth annual Short Course for Veterinarians at the Louisiana State University on Feb. 8-9, 1949, the ladies enjoyed a luncheon and a demonstration and talk on "Preparation of Food for Storage."

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Michiana Auxiliary.—New officers of the Women's Auxiliary to the Michiana Veterinary Medical Association are: Mrs. W. A. Mackenzie, Nappannee, Ind., *president;* Mrs. H. J. Magrane, Jr., Mishawaka, Ind., *vice-president;* Mrs. Alan Winter, Benton Harbor, Mich., *secretary;* and Mrs. M. L. Weldy, Wakarusa, Ind., *treasurer.*

At the Feb. 9, 1949, meeting, the following reports on the Indiana State Auxiliary meeting were given: Mrs. E. S. Weisner, Goshen, Ind., business; Mrs. K. R. Fraser, Niles, Mich., social; and Mrs. W. G. Magrane, Mishawaka, Ind., membership in the national auxiliary.

s/Mrs. W. A. Mackenzie, *President.*

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Mrs. Miller, Secretary-Treasurer.—One of the most important offices of the Women's Auxiliary is that of the secretary-treasurer. Keeping accurate records and administering the funds of the organization not only require a person of business ability but one who is conscientious about the program and development of the Auxiliary. For the past six years, Mrs. C. L. Miller of River Forest, Ill., has served in this capacity.

This past year, the membership roll has been catalogued by states, giving information as to the number of members in each state, and also the length of time each member has been affiliated with the Women's Auxiliary to the AVMA.

Mrs. C. L. Miller

As a result of this record, a mimeographed directory will be ready for distribution by early summer. The directory will be available to the president and secretary of each affiliated state, regional, and provincial auxiliary.

Preceding the annual convention, Mrs. Miller keeps in close touch with all states, sending copies of the minutes of the preceding meetings of the House of Representatives and of the General Assembly of the Women's Auxiliary. She will also be prepared to issue a copy of the treasurer's report to each state in advance of state conventions. Mrs. Miller issues membership certificates annually and provides state officers with application blanks for membership and copies of the constitution and by-laws.

s/(Mrs. A. E.) Ethlyn Bott, *President.*

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

Batson, Neal C.
Veterinary Hospital, Sumter, S. Car.
D.V.M., Alabama Polytechnic Institute, 1940.
Vouchers: R. W. Beaty, Jr., and L. C. Merrett.

Carter, Gordon R.
Dept. of Vet. Hyg., I.S.C., Ames, Iowa.
D.V.M., Ontario Veterinary College, 1943.
Vouchers: H. J. Ruebke and T. Lloyd Jones.

Garling, John W.
3165 Sylvania, Toledo 12, Ohio.
D.V.M., Michigan State College, 1943.
Vouchers: G. T. McCarty and B. Howstrawser.

HAMMER, WALTER D.
784 El Portal Pk., San Pablo, Calif.
D.V.M., Alabama Polytechnic Institute, 1945.
Vouchers: C. L. Gould and G. B. Jones.

MITTELSTED, GALE W.
212 Pine St., Chaska, Minn.
D.V.M., Iowa State College, 1944.
Vouchers: O. B. Gochnauer and G. E. Keller.

PEGG, CHARLES E., JR.
Kanagawa Military Government Team, APO 503, c/o Postmaster, San Francisco, Calif.
D.V.M., Colorado A. & M. College, 1940.
Vouchers: Karl H. Willers and Henry E. Hess.

RICKARDS, DAVID A.
212 Walnut St., Aurora, Ill.
M.R.C.V.S., The Royal Veterinary College, 1948.
Vouchers: L. A. Dykstra and T. M. Dubrawski.

RUSSELL, BEN L.
909 Pile St., Clovis, N. M.
D.V.M., Texas A. & M. College, 1947.
Vouchers: W. Larson and E. E. Kraus.

SHEPARD, SHIRLEY
Box 214, Moultrie, Ga.
D.V.M., University of Georgia, 1932.
Vouchers: C. C. von Gremp and C. C. Rife.

VILLAMIL, JUAN A.
Ciudad Universitaria, Bogota, Colombia.
D.V.M., New York State Veterinary College, 1945.
Vouchers: H. L. Gilman and D. Pacheco-Perez.

WEMPE, LILLIS R.
Station Veterinarian, Shaw Field, Sumter, S. Car.
D.V.M., Kansas State College, 1935.
Vouchers: R. W. Beaty, Jr., and L. C. Merritt.

Second Listing

Bay, William W., Bldg. 1, Apt. 8, Rose Ade Drive, West Lafayette, Ind.
Brito, Roberto J., Dominguez No. 504, Cerro, Havana, Cuba.
Burdick, Howard E., 15348 Ward Ave., Detroit 27, Mich.
Butler, Glenn C., 3566 Port Arthur Rd., Beaumont, Texas.
Douglas, Samuel E., 315 N. Cherokee Ave., Tahlequah, Okla.
Forney, Homer S., 4 Campbelltown Rd., Palmyra, Pa.
Fowler, Thomas A., 2108 W. 50th Terrace, Kansas City 2, Mo.
Frye, Donovan N., 3231 W. French, San Antonio, Texas.
Galbraith, William T., 405 W. Penn St., Camden, N. J.
Given, Josiah A., 1821 Bemidji Ave., Bemidji, Minn.
Gouge, Hardin E., 711 W. Main St., Sedalia, Mo.
Hipenbecker, Ralph B., Fennimore, Wis.
Linn, Frank J., Sheffield, Iowa.
Linn, Samuel D., Humboldt, Iowa.
McCallum, Daniel W., 513 Crittenden St., N. W., Washington 11, D. C.
Myers, Carlton H., Box 799, Americus, Ga.
Page, Harvey F., P.O. Box 428, Washington, Ind.
Rieke, Ralph W., 400 S. Jefferson St., New Ulm, Minn.
Santamaria, Serafin, Buenos Aires No. 32, Cerro, Havana, Cuba.
Stratmeyer, Ernest H., 657 Leva St., Hillsboro, Ill.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S. BAI are reported as of Feb. 21, 1949, by Chief B. T. Simms.

TRANSFERS

Paul M. Cellar, from Charleston, W. Va., to Madison, Wis.
Truman W. Cole, from New York, N. Y., to Washington, D. C.
James W. Connelly, from Mexico City, Mexico, to Los Angeles, Calif.
Mack B. Davis, from San Francisco, Calif., to Los Angeles, Calif.
Leonidas L. Denson, from Jackson, Miss., to Nashville, Tenn.
Greydon P. Forrest, from Cedar Rapids, Iowa, to Omaha, Neb.
Melvin E. Hodgson, from Oklahoma City, Okla., to Omaha, Neb.
Charles A. Klein, from Albany, Ga., to Tallahassee, Fla.
Clement Lunneen, from St. Joseph, Mo., to Tallahassee, Fla.
Marvin P. Polak, from Jacksonville, Fla., to Los Angeles, Calif.
Jordan E. Rasmussen, from Mexico City, Mexico, to Salt Lake City, Utah.
Luke R. Sinclair, from San Francisco, Calif., to Beltsville, Md.
Claude A. Smith, from Olympia, Wash., to Washington, D. C.
Dennis E. Sweeney, from Kansas City, Kan., to St. Joseph, Mo.
Franklyn W. Timm, from Omaha, Neb., to Green Bay, Wis.
Andrew L. Walsh, from St. Paul, Minn., to Austin, Minn.

SEPARATIONS

Rudolph Snyder, Washington, D. C.
Eugene Combs, Sioux City, Iowa.
Clarence J. Cook, Sacramento, Calif.
Robert V. Fox, Jefferson City, Mo.
Belmont A. Kittrell, Jacksonville, Fla.
Charles E. Dimon, Los Angeles, Calif.
Charles A. Klein, Tallahassee, Fla.
Frank H. Benjamin, Baltimore, Md.
Raymond C. Costello, Newark, N. J.
Eugene R. Benson, Madison, Wis.
John Wirthlin, San Antonio, Texas (death).
Dale B. Stewart, South St. Paul, Minn.
David Eisenberg, Newark, N. J.
Edward A. Droleskey, New York, N. Y.
Henry W. Harper, Mexico City, Mexico.

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Course offered in Laboratory Diagnosis of Rabies.—A one week course in the Laboratory Diagnosis of Rabies will be offered April 25-29, 1949, at the laboratories of the Communicable Disease Center in Atlanta, Ga.

This training is open to all grades of employed laboratory personnel. Although first

consideration will be given to the laboratories of state and local public health departments and other official agencies responsible for the diagnosis of rabies, applicants from hospitals and private laboratories will be considered when vacancies occur. Laboratory directors and senior staff members wishing to attend the course may do so.

There is no tuition or laboratory fee but travel and living expenses must be paid by the individual or his employer.

Applications for the courses should be made as far in advance as possible. It is suggested that trainees obtain reservations for living accommodations at the earliest possible date. A list of hotels and rooming houses will be sent to applicants at the time of acceptance.

Address all correspondence to Dr. E. S. Tierkel, Communicable Disease Center, 605 Volunteer Bldg., Atlanta 3, Ga.

AMONG THE STATES AND PROVINCES

Arizona

State Officers.—At the annual meeting of the Arizona Veterinary Medical Association in Phoenix on Dec. 10, 1948, the following officers were elected: Drs. Robert E. McComb, Jr., Phoenix, *president;* F. H. Olvey, Phoenix, *vice-president;* and F. G. Hamilton, Phoenix, *secretary-treasurer.* Drs. C. A. White, Jr., A. M. Smith, and Paul McQuown were elected to the Executive Committee.

Dr. J. C. Norton, Phoenix, original territorial veterinarian, was voted honorary member of the Association.

s/R. E. McCOMB, JR., *Resident Secretary.*

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Veterinarians at Dog Show.—Dr. Louis R. Becker was veterinarian in charge at the Sahuaro State Kennel Club Dog Show on March 19-20, 1949, in Phoenix. Other veterinarians in attendance were Drs. W. E. Merritt, Phoenix; J. R. Carney, Chandler; and Charles A. White, Mesa.

Arkansas

State Officers.—Officers of the Arkansas Veterinary Medical Association are Drs. Rease Mitcham, Little Rock, *president;* Willard C. Brooks, Prairie Grove, *vice-president;* and Thayer D. Hendrickson, Little Rock, *secretary-treasurer.*

s/T. D. HENDRICKSON, *Secretary.*

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Shortage of Veterinarians.—Having come face to face with the shortage of accredited veterinarians needed in the plan to develop the livestock industry, especially the dairy branch, misinformed members of the Arkansas General Assembly have introduced a bill authorizing the licensing of persons who have practiced the "veterinary art" for four or more years. They were obviously unaware that certifying to the health of animals by such persons would not be recognized beyond the state line. I don't know how many states are as bad off as ours, but the clippings enclosed ought to make interesting reading to anyone seeking an over-all idea of the nation's veterinary service.

s/FRANK HURLBUT, *Retired BAI Inspector, Yellville, Ark.*

Comment.—The clippings are newspaper editorials on the current proceedings of the General Assembly. Under date of January 23, 1949, *The Arkansas Gazette* published a stinging rebuke, pointing out that the laxity in granting veterinary licenses has given the state a bad name among the southern states which are giving the needed attention to veterinary education. Quoting: "Graduates shun Arkansas because of its low professional standards. . . . The South is looking forward to establishing veterinary schools in order to meet the great general need. . . . But, if Arkansas once again fails to enact a strict licensing law there would be a question whether Arkansas graduates would want to practice at home where the value of their training is not recognized."

The editorial is strong and wholesome. It forecasts an awakening too long postponed, not only in Arkansas but in other states. Under the present understanding of veterinary service all over the world, the choice is not between a sick calf and a sick child, as one of the assemblymen wisecracked from the well of the House, but between the poverty and prosperity of the people and the industries.

As long as the functions of our branch of medicine are that badly understood there will remain a lot of groundwork to do in the field of public relations. The very fact that low standards of veterinary training can still find roaring champions among the lawmakers of an agricultural state shows that the economics of animal pathology is truly a neglected branch of general learning.

Another bill (HB93), introduced by Representative Howell, would limit the issuing of licenses to veterinarians who are graduates of recognized schools. According to one of the editorials, "The enactment of Representative Howell's bill would recognize veterinary medicine as a profession and, in time, would afford adequate protection for the state's valuable livestock enterprise."—ED.

California

Dr. McIntyre Speaks on Arthritis Symposium.—The Los Angeles County Medical Association Section on General Practice was host to the American Anti-Arthritis Association, the Southern California Veterinary Medical Association, The American Academy of Applied Nutrition, and the Los Angeles County Dental Society, when a symposium on arthritis was presented. Dr. Rankin W. McIntyre presented the veterinarian's side of the problem in his paper "Arthritis from a Nutrition Aspect in Domestic Animals, and its Relation to Infection."

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Dr. Hart to Speak before United Nations.—Dr. George H. Hart, dean of the School of Veterinary Medicine on the Davis campus of the University of California, has been invited by Trygve Lie, secretary-general of the United Nations, to address a special conference of the

United Nations Economic and Social Council. The conference, to be held in the United States in June and July, 1949, will deal with the conservation and utilization of world resources.

Dr. Hart will speak about the conservation of livestock resources by disease control. He will stress disease prevention in livestock conservation and production; statistics of livestock losses due to disease; and methods of prevention, including quarantine, to halt introduction and spread of disease.—*The California Veterinarian, January-February, 1949.*

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Dr. Duckworth Reports on Foot-and-Mouth Disease Situation.—Under the direction of the California state senate, the Livestock Disease Committee conducted an extensive survey of the foot-and-mouth disease eradication program being administered jointly by the Mexican and American governments. As a member of this Committee, Dr. Duckworth testified before Congressional committees in Washington, D. C., in February, and participated in the sessions of the National Foot-and-Mouth Disease Advisory Committee called by the Secretary of Agriculture.

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Examination for Livestock Inspector.—The State Personnel Board will accept applications continuously for position of veterinary livestock inspector until further notice. Applicants must have a valid license to practice veterinary medicine in California. The salary is $341 to $415. Duties include investigating and instituting control procedures in outbreaks of diseases affecting livestock; inspecting foreign shipments of animal products at ports of entry; testing livestock; recommending treatment; and issuing quarantines. The Department of Agriculture uses this class and employment may occur throughout the state.

Colorado

Personal.—Dr. G. H. Gilbert, mayor of Arvada, was voted delegate to the national meeting of the AVMA at the tenth annual conference for veterinarians at Fort Collins on Feb. 21-23, 1949. Dr. M. N. Riemenschneider, Gunnison, was named alternate.

Georgia

Georgia Law Forbids Metal on Feed Bags.—A new law prohibiting the use of metal tags, plates, or other metal articles deemed a menace to livestock on feed sacks, has been passed by the Georgia legislature (*Feedstuffs*, Feb. 26, 1949). The law does not apply to feed intended for poultry. Only substances of a metallic nature which are approved by the commissioner of agriculture as not constituting a menace to livestock may be used.

Idaho

Southwest Association.—The Southwest Idaho Veterinary Medical Association met on Feb. 22, 1949, at the Dewey Palace Hotel in Nampa. The scientific program follows:

DR. R. C. DERRER, Meridian: "General Problems Confronting the Practitioner in this Area."

DR. E. DON COPPLE, Boise, president of the Idaho VMA: "Review of the January Meeting of the Intermountain Veterinary Medical Association."

DR. T. R. MYERS, U.S. BAI, Boise: "The Rôle of the Practitioner in an Efficient Federal-State Coöperative Brucellosis Eradication Program."

DR. A. P. SCHNEIDER, state veterinarian, Boise: "Legislative Matters of Concern to the Veterinarian."

Officers of this association are Drs. R. C. Derrer, Meridian, *president;* and A. P. Schneider, Boise, *secretary.*

A complete and varied program was enjoyed by the ladies.

S/A. P. SCHNEIDER, *Secretary.*

Indiana

Avian Pneumoencephalitis.—A newsy letter from Dr. Frank Tucker, Claypool, on his experiences with the use of diethylstilbestrol for tenderizing poultry meat adds, "You may be interested in knowing that we are having considerable Newcastle disease. I have vaccinated over 1,400." Frank, as everyone knows or ought to know, is one of the few veterinarians in this country who has shown that poultry science is not foreign to clinical veterinary medicine.

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No Vote on Veterinary School at Purdue.—The bill introduced in the 1949 General Assembly of Indiana to establish a school of veterinary medicine at Purdue University, Lafayette, was held in committee and therefore did not come to a vote before the legislature adjourned.

Iowa

Two promotions have been announced by Fort Dodge Laboratories, Inc. Dr. B. J. Gray (ISC '43), formerly assistant laboratory director, has been appointed superintendent of

Dr. B. J. Gray (left) and Dr. John R. Dick

the biological farm; and Dr. John R. Dick (OSU '42), formerly of the product development department, has been named to succeed Dr. Gray as assistant biological director, in charge of biological production. Dr. Gray is secretary-treasurer of the North Central Iowa Veterinary Medical Association and a member of the committee on biological and pharmaceutical products of the U. S. Livestock Sanitary Association. Dr. Dick is secretary of the Veterinary Biological Licensees' Association.

Kentucky

Expand Veterinary Research Facilities.—Only recently completed, the animal pathology building of the Kentucky Agricultural Experiment Station "is recognized as the newest and one of the largest projects devoted entirely to animal diseases, doing more horse work than any other, except possibly the University of Pennsylvania," according to *Blood Horse*, Nov., 1948. Sixteen research workers are on the staff which, at present, is giving major attention to the study of virus abortion and jaundiced foals. The state of Kentucky appropriates only 25 per cent of the funds needed

The animal pathology building at the Kentucky Agricultural Experiment Station, Lexington.

to operate the laboratory; the balance comes from federal grants and from the Grayson Foundation which is financed by horsemen.

Tribute is paid in the article to Dr. W. W. Dimock, who joined the staff of the Kentucky station in 1919 and brought the Department of Animal Pathology "an international reputation." Though now retired as head of that department, Dr. Dimock remains on the staff. Dr. F. E. Hull has headed the department since 1946.

Louisiana

Editorial Stresses Role of the Veterinarian.—The rôle of the veterinarian in modern civilization is the theme of an editorial which appeared in the *Baton Rouge Morning Advocate* for Dec. 14, 1948. With the spread of X disease to Louisiana, said the *Advocate*, the importance of the veterinarian in conserving the food supply and preventing spread of disease to man, through livestock disease prevention and control, is realized anew. "The livestock industry of today would be impossible without veterinary medicine, and our present standard of living would be impossible without the highly organized livestock industry that we now have."

s/R. B. LANK, *Baton Rouge*.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Association was held Feb. 16, 1949, at the Hotel Statler. Dr. Gerry B. Schnelle, assistant chief of staff of the Angell Memorial Animal Hospital, spoke on "X-Ray Diagnosis in Small Animal Practice." Everyone participated in an informal discussion after the presentation. Officers for 1949 are Drs. E. M. Dowling, Springfield, *president*; J. J. Murphy, Cambridge, *first vice-president*; F. L. Briggs, Attleboro, *second vice-president*; and C. L. Blakely, Boston, *secretary-treasurer*.

s/C. LAWRENCE BLAKELY, *Secretary*.

Michigan

Southeastern Society.—At the meeting on Feb. 9, 1949, the Southeastern Michigan Veterinary Medical Society voted to join the Michigan Agricultural Conference in order to participate in its drive to help secure funds for the School of Veterinary Medicine at Michigan State College. Dr. Robert Willson, Detroit, was appointed representative to the Conference.

Dr. Bernard Alfredson, professor and head of the Department of Physiology and Pharmacology, School of Veterinary Medicine, Michigan State College, spoke on "Anesthesia" at this meeting.

s/W. N. KONDE, *Secretary*.

Missouri

Kansas City Association.—The regular monthly meeting of the Kansas City Veterinary Medical Association was held Feb. 14, 1949, at the Hotel Continental. Dr. C. D. Van Houweling, director of professional relations of the AVMA, Chicago, spoke on "A Message to Veterinarians on Agricultural Relations." His paper was followed by an open discussion on current practice problems.

s/EARL L. MUNDELL, *Secretary*.

Montana

Little International Livestock Show.—The fifteenth annual Little International Livestock Show to be held at Montana State College, Bozeman, on May 19-20, 1949, will follow the general pattern of the other shows. Student showmen will be judged on their showmanship ability and how well they have trained their animals for the ring.

Nevada

State Association.—The annual meeting of the Nevada State Veterinary Medical Association was held Feb. 4-5, 1949, at the University of Nevada, Reno. Despite the extremely adverse weather conditions, 21 veterinarians attended. The following scientific program was presented:

DR. E. E. MAAS, Reno: "Report on the Annual Meeting of the U.S. Livestock Sanitary Association."

DR. CHARLES H. REID, Hollywood, Calif.: "Some Experiences of a Veterinarian in Hollywood."

DR. L. R. VAWTER, Reno: "Molybdenum Poisoning of Cattle."

DR. GORDON SHULTZ, Sacramento, Calif.: "Sheep Diseases."

DRS. NICK KLAICH and W. F. FISHER, Reno: "Report on the Annual Meeting of the Intermountain Veterinary Medical Association."

The annual dinner was held at the El Cortez Hotel. Dr. E. S. D. Merchant, Reno, gave an interesting account of his experiences in the Philippine Islands, prior to, and during, World War II.

Officers elected were Drs. Joe B. Key, Reno, *president*; W. B. Earl, Reno, *vice-president*; and Edward Records, Reno, *Secretary-treasurer*.

s/EDWARD RECORDS, *Secretary*.

New Jersey

State Officers.—At the sixty-fifth annual meeting of the Veterinary Medical Association of New Jersey in Trenton, on Feb. 3-4, 1949, the following officers were elected: Drs. Robert P. Lawrence, Holmdel, *president;* J. B. Engle, Summit, *first vice-president;* Elwood G. Fooder, Haddonfield, *second vice-president;* J. R. Porteus, Trenton, *secretary;* and Arthur F. North, Somerville, *treasurer.*

s/J. R. PORTEUS, *Secretary.*

New York

New York City Association.—The regular meeting of the Veterinary Medical Association of New York City was held at the Hotel Statler on March 2, 1949. Dr. Ellis P. Leonard, professor of veterinary therapeutics and small animal diseases, and director of the small animal clinic, New York State Veterinary College, Ithaca, spoke on "Gastroenteritis in Small Animals."

s/C. R. SCHROEDER, *Secretary.*

Pennsylvania

Central Association.—The Central Pennsylvania Veterinary Medical Association held a reorganization meeting at Sunbury on Feb. 16, 1949. New officers are Drs. Lynn Peterson, Lewistown, *president;* W. P. Bond, Bloomsburg, *secretary-treasurer;* J. A. Muffly, Lewisburg, *trustee to the state VMA;* and W. A. Troutman, Elizabethville, as *alternate* trustee.

s/W. P. BOND, *Secretary.*

Bucks Montgomery Association.—The regular monthly meeting of the Bucks Montgomery Veterinary Medical Association was held in the Moose Home at Doylestown on March 9, 1949. Dr. David K. Detweiler, physiologist at the School of Veterinary Medicine, University of Pennsylvania, spoke on "Acute Calcium Toxicity."

s/J. G. SHUTE, *Secretary.*

Quebec

Provincial Association.—At the twenty-third general meeting of the College of Veterinary Surgeons of the Province of Quebec at Montreal on Sept. 17-19, 1948, the following officers were elected: Drs. J. M. Veilleux, Quebec City, *president;* Martin Trépanier, St. Hyacinthe *vice-president;* Paul Villeneuve, Joliette, *secretary-treasurer;* J. D. Nadeau, St. Hyacinthe, *registrar;* and Gustave Labelle, St. Hyacinthe; Charles Grégoire, Montreal; Mathias Chagnon, Montreal; Camille Léveillé, Rèvière-du-Loup; and Armand Brassard, Charlesbourg, *governors.*

s/JOSEPH DUFRESNE.

Saskatchewan

Association Officers.—At the November, 1948, meeting of the Saskatchewan Veterinary Association, the following officers were elected: Drs. N. D. Christie, Regina, *president;* G. McDonald, Assiniboia, *vice-president;* and A. Chambers, Regina, *secretary-treasurer.*

s/A. CHAMBERS, *Secretary.*

Members of the faculty of the Ecole de Médecine Vétérinaire de la Province de Québec, Saint Hyacinthe.

First row (left to right)—Drs. Jacques St. Georges, histology, pathology, and secretary of the School; Gustave Labelle, ethics, medicine, and dean of the School; Joseph Dufresne, anatomy, and director of studies at the School; Joseph D. Nadeau, nutritional diseases, swine and ovine diseases, and the administrative controller of the School.

Second row (left to right)—Drs. Ls de G. Gélinas, histology, pathology, small animal clinic; Claude Allard, chemistry; Gérard Lemire, small animal clinic, diseases of small animals, and poultry diseases; Martin Trépanier, large animal clinic, surgery, ambulatory clinic; Philodore Choquette, obstetrics, anatomy; and René Pelletier, ambulatory clinic, medicine, horseshoeing.

Left inset, Dr. Paul Genest, chief, Provincial Veterinary Research Laboratory, St. Hyacinthe. Right inset, Dr. Lucien Cournoyer, who teaches pathology, diagnosis, and roentgenology.

Texas

Dallas-Fort Worth Association.—The Dallas-Fort Worth Veterinary Medical Association met in Fort Worth on March 2, 1949. Dr. T. T. Chaddock spoke on "Encephalitis in Dogs," and Mr. Peter N. Jans, Evanston, Ill., discussed "The Silent Partner Group Insurance Plan."

Officers of this association are Drs. H. H. Greenlee, Forth Worth, *president;* Jack Heaton, Fort Worth, *secretary.*

s/LEON G. CLOUD, *Secretary of the TVMA.*

Virginia

State Association.—The Virginia State Veterinary Medical Association met at the Hotel Roanoke in Roanoke on March 3-5, 1949. After President E. P. Johnson's address, the program was presented.

DR. CHAS. C. RIFE, Atlanta: "The Georgia Veterinarian" and "Ear Trimming."

DR. A. M. LEE, Pathological Division, U.S. BAI, Washington, D.C.: "Hyperkeratosis of Cattle."

DR. A. K. KUTTLER, veterinarian in charge, Tuberculosis and Brucellosis Eradication Division, U.S. BAI, Washington, D.C.: "Brucellosis—Established and Proposed Control Methods."

DR. S. F. SCHEIDY, Sharp and Dohme, Philadelphia, Pa.: "Lyophilized Brucella Vaccine."

DR. S. B. HITCHNER, Blacksburg: "Further Observations on a Virus of Low Virulence as a Vaccine for Newcastle Disease."

DR. H. T. FARMER, Richmond: "Veterinary Restraint."

MAJOR T. C. JONES, V.C., Army Institute of Pathology, Washington, D.C.: "Diagnosis and Prevention of Equine Periodic Ophthalmia."

A panel discussion on "Veterinary Ethics" was presented. Members of the panel were Drs. John B. Woodworth, Waynesboro; E. E. Thompson, Salem; and C. R. Pastors, Staunton.

Films shown during the program were "Equine Infectious Anemia," "Newcastle Disease," "From Range to Range," "Meats with Approval," and "Training You to Train Your Dog."

Officers elected at this meeting were Drs. W. F. Witter, Richmond, *president;* F. E. Mullen, Harrisonburg, *first vice-president;* J. B. Woodward, Waynesboro, *second vice-president;* H. K. Royer, Lynchburg, *secretary;* and J. S. Landis, Norfolk, *treasurer.* Dr. H. K. Cooper was elected resident secretary of the AVMA. Dr. Cooper is a member of the State VMA and of the AVMA.

s/W. L. BENDIX, *Secretary.*

Washington

State Officers.—Officers elected at the fortieth annual meeting of the Washington State Veterinary Medical Association in Yakima on Nov. 5, 1948, are Drs. M. O. Mulqueeny, Sunnyside, *president;* LaMar Gaw, Seattle, *vice-president;* J. L. Ellis, Olympia, *secretary-treasurer;* and E. E. Wegner, H. A. Trippeer, P. S. Millard, Bert Menig, P. G. MacKintosh, Norman Garlick, and LaMar Gaw, *Board of Trustees.*

s/J. L. ELLIS, *Secretary.*

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Drs. Nelson and Brose Join Veterinary Faculty.—Dr. Norman M. Nelson (ISC '34) has been added to the staff of the State College of Washington as assistant professor of veterinary pathology. Dr. Nelson spent several years with the U.S. BAI in various assignments including the Regional Poultry Research Laboratory at Michigan.

Dr. C. P. Brose (OSU '27) has joined the staff of the College of Veterinary Medicine as associate professor in the Department of Veterinary Hygiene and Pathology. He will teach bacteriology and hygiene. Dr. Brose was employed for ten years in the Department of Public Health at Albany, N. Y., was professor of pathology at veterinary colleges at the Texas and Oklahoma A. & M. colleges, and has also been engaged in general practice.

s/R. E. NICHOLS, *Dean.*

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Course in Diseases of Furbearing Animals.—A course in the diseases of furbearing animals has been added to the curriculum of the College of Veterinary Medicine at the State College of Washington. It includes discussion on bacterial, viral, nutritional, and parasitic diseases of mink, fox, and chinchilla. This class will be offered to the graduating seniors in veterinary medicine, and will be taught by Dr. John R. Gorham, assistant professor of veterinary hygiene and pathology, and coöperating agent of the U.S. BAI. Dr. Gorham is also in charge of the Pullman Fur Animal Disease Research Laboratory, a coöperative project between the BAI and the State College of Washington.

FOREIGN NEWS

Algeria

Murderous Outbreak of Canine Distemper.—Last year, Algeria was visited with a deadly outbreak of canine distemper which greatly reduced the number of dogs. Some districts had but 1 or 2 dogs left. The disease, neurotropic in character, struck without premonitory symptoms and killed in one to five days, epileptic symptoms predominating. Dogs of all breeds and ages were victims, even those reputed to be highly resistant to the disease. Medical treatment was futile and ferret vaccine failed to check the spreading infection.

Belle Isle, a thousand acre recreation spot within sight of Detroit's skyline, lies in the middle of the Detroit River.

Mougeot (*Rec. Méd. Vét.*, Oct., 1948) opined that the virus responsible for the unusual clinical tableau had a peculiar affinity for the sympathetic nerves that govern the organs generally affected.

China

Rabies Vaccination.—The Hong Kong Government plans to make the vaccination of all dogs a prerequisite to application for a license—with heavy penalties for failure to apply for a license. The Urban Council, which controls veterinary affairs, has recommended that "the vaccine be imported from the United States in preference to any other imported source, as it is of known potency and high standard." In addition, it can be imported more cheaply than it can be produced in China.

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Rinderpest Control.—Veterinarians have inoculated all bovine animals in the Lantao Island area and have prohibited the movement from the island of any stock. The vaccine considered most suitable is formalized spleen pulp prepared by the Pasteur Institute in Indo-China. —[From a report prepared by Ralph H. Hunt, American Consul, for George D. Hopper, American Consul General, Hong Kong.]—*J. H. Steele, D.V.M., Washington, D. C.*

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Iodine Deficiency Demonstrated.—A graphic demonstration on the importance of iodine on mammalian life was the high incidence of cretinism and goiter resulting from the Japanese stranglehold on transportation, during the war, which cut off from the hinterland the supply of salt containing preventive amounts of iodine. Massive evidence collected since 1940 showed that iodine privation for a period of six months brought tragic results to higher life—a reminder of what the nutritional situation would be in Switzerland, the Great Lakes Region, and the central Great Plains of North America but for supplemental iodine.

England

The King's Horses—An outbreak of influenza among the horses of Buckingham Palace made the AP news in February. "Instead of marching up the hill with the King's men, the horses are running a high temperature" was the way the news broke in the newspapers. An amazed "stable official" declared that this was the first time such a thing had happened in the royal stables, but he didn't let horsedom in on the secret of keeping out the elusive ailment during so long a stretch of time. That would be something to tell the world.

France

Fresh Eggs.—A ministerial decree, dated March 9, 1948, prohibits the use of the terms "fresh" or "strictly fresh" for eggs having an air chamber exceeding 6 mm. in depth. Others must be marked indelibly with the figure 2, 1 cm. in height. An alternative is to sell eggs as unqualified, meaning let the buyer beware. The decree permits the producer to mark eggs with his name and the date laid. Dealers in the *caveat emptor* class of eggs are permitted to mark them "conserved," "refrigerated," or "stabilized" with stated geometric figures designating the three grades—circle, triangle, and lozenge. The sale of eggs unfit for consumption is prohibited entirely.

India

Brucellosis in India.—A brucellosis survey in India showed that the incidence in bovine animals apparently varies according to the amount of rainfall, the highest incidence often occurring in humid, rainy areas having little continuous sunshine. Poor sanitation and crowding are other important factors.

Brucella abortus and a so-called Indo-Indonesian variant strain intermediate between *Br. abortus* and *Brucella melitensis* are responsible for most of the cases, although a few are caused by *Br. melitensis*. As the suis variety has not been isolated, it perhaps does not occur in India.

Due to the almost universal custom of boiling milk, human brucellosis is not widespread in India, although it seems probable that unrecognized cases do occur from contact with infected animals.—[*From Indian J. Vet. Sci. and Anim. Husb., (Sept., 1947).*]

Israel

Israel's Veterinary Journal. — The world's newest independent government—the State of Israel—has a quarterly journal of veterinary medicine, *Refuah Veterinarith*, now in its fifth volume. It is written in the unfamiliar hieroglyphics of the Hebrew language and, of course, reads from right to left. The names of the contributors of the July (1948) issue are Goor, Kahane, Gurowitz, Schwartz, Sulman, Twerski, Bornstein, and Shoshan. The subjects discussed are cattle plague (rinderpest), avian pneumoencephalitis (Newcastle disease), teat operations, prolactin in milk production, Palestine veterinary history, calf scours, cattle pododermatitis (foot rot), vitamin A and vitamin E therapy, artificial insemination, and the veterinary service of Israel.

Praise not our translations of non-Latin tongues. The table of contents is printed in English.

Mexico

Foot-and-Mouth Disease Situation.—"U. S.-Mexico Joint Commission Pleased with the Vaccination Program"—headline in a prominent farm paper—indicates that the *anti-aftosa* campaign promises to achieve its objective. The aim is the vaccination of a million cattle every month in 1949 with Mexican-produced vaccine. The collaboration of the Mexican farmers and press is a heartening turn from the earlier attitude toward the joint program. Hundreds of trained workers are speeding up the aggressive campaign now universally endorsed. Seventy, three-man teams assigned to step up vaccination are being assisted by preliminary and post-vaccination inspections; and hardships caused by the U.S. quarantine against Mexican cattle is being rapidly appeased by building meat-packing plants at convenient locations, the end result of which is being envisaged as

a boom to the Mexican cattle industry. Thus, the threatened economy of the North American continent is being protected against a major catastrophe, thanks to the vigil of the veterinary profession.

Philippine Islands

State University Transferred.—The long-planned transfer of the State University of the Philippines to a more advantageous site has finally been approved by the president of the Philippine Republic. The new location is about 10 mi. from Manila proper and has an area of approximately 1,556 acres. Plans call for completion of the building program in 1951. All the buildings will be of modern architecture, and a botanical and zoölogical garden and a modern hospital are included in the plans. These are to be financed, in part, by funds allotted by the War Damage Commission.

Together with other colleges, with the exception of the College of Medicine, the College of Veterinary Medicine was transferred from Pandacan, Manila, to Diliman, Quezon City. It has a total enrollment of 55 students, and ten faculty members, with Dr. Angel K. Gomez as the dean. The transfer did not affect the enrollment, but more students are expected next semester. Modern equipment and textbooks, as well as a supply of the newer drugs, are to be added to the College.

s/Jose B. Aranez.

Turkey

Society of Comparative Pathology.—Veterinary science is well represented on the program of the *Ve Congrès International de Pathologie Comparée* to be held at Istanbul, Turkey, May 18-20, 1949. The Society is composed of physicians, veterinarians, pharmacists, and biologists "who are interested in comparative pathology." Its mouthpiece is *La Revue de Pathologie Comparée et d'Hygiene Générale*, now in its 48th volume. The veterinarians and subjects (trans.) listed on the program are:

DRS. TURPIN and LESBOUYRIES: "Lethal Hereditary Factors."

DRS. SIMONNET and CLEMENT: "Hypervitaminosis A and D."

DRS. VERGE and RARIETY: "Portal of Entrance of the Tubercle Bacillus in Man and Animals."

DR. RAMON: "Principles of Anatoxins and Anavaccines in Comparative Immunology."

DRS. RAMON and RICHOU: "Microbic Antagonism in Man and Domestic Animals."

DR. ACKAY: "Diagnostic Value of Allergic Reactions in Animal Tuberculosis."

DR. AYGUN: "Relations of Allergy to Distomiasis."

A notable contribution by Turkish scientists is entitled "Paralytic Accidents Observed in the Course of Antirabic Treatment." The prominence given to domestic animals and plant life in this segregated branch of learning broadens the meaning of pathology.

STATE BOARD EXAMINATIONS

Illinois—The Veterinary Division of the Illinois Department of Registration and Education will hold a veterinary examination in Chicago on Sept. 26-28, 1949. Applications should be on file at least fifteen days prior to date of examination. Address inquiries and applications to Fred W. Ruegg, Superintendent of Registration, Department of Registration and Education, Springfield, Ill.

Massachusetts—The Massachusetts Board of Registration in Veterinary Medicine will hold examinations for registration on June 16-18, 1949, at Amherst. The latest date for filing applications is June 2, 1949. Address inquiries to Dr. B. S. Killian, secretary, Board of Registration in Veterinary Medicine, Room 413-N State House, Boston 33, Mass.

Oklahoma—The Oklahoma Board of Veterinary Medical Examiners will hold examinations on June 8 and 9, 1949, at the Oklahoma A. & M. College, Stillwater. For further information and application blanks address Dr. N. L. Astle, Board of Veterinary Medical Examiners, Blackwell, Okla.

Pennsylvania—The Pennsylvania State Board of Veterinary Medical Examiners will give written examinations for registration to practice veterinary medicine on June 16-17, 1949, at the University of Pennsylvania, Philadelphia. Applications must be received by May 15, 1949. William E. Martindale, Harrisburg, Pa., Secretary.

MARRIAGES

Dr. Larry E. McClaughry (KSC '46), Arlington, Neb., to Miss Donna Gene Dahl, Fremont, Neb., on June 20, 1948.

Dr. Ralph W. Fogleman (KSC '47), Omaha, Neb., to Miss Betty A. Stroud in Dallas, Texas, on Aug. 12, 1948.

Dr. Phillis M. Hickney (KSC '47), to Charles McLeod Larson, Sept. 10, 1948, at Myrtle Beach, S. Car.

Capt. Robert P. Clark (OSU '43), V.C., Cleveland, Ohio, to Miss Mabel Hill, Ware Shoals, S. Car., on Nov. 23, 1948.

Dr. Elmer L. Robinson (CORN '47), Ballston Spa, N. Y., and Dr. Ruth Jones (CORN '47), Port Richmond, N. Y., were married at West Brighton, Nov. 28, 1948. Both are members of the AVMA. Before her graduation, Mrs. Robinson was secretary of the Cornell student chapter of the AVMA, and was one of the founders of Gamma Phi Iota, the first veterinary sorority in the U. S.

Dr. J. W. Howder (TEX. '39), Rosalia, Wash., to Miss Lorraine Case on Nov. 21, 1948, in Spokane.

BIRTHS

To Dr. (KSC '41) and Mrs. Gilbert W. Carl, Abilene, Kan., a son, Richard Allen, on Nov. 2, 1948.

To Dr. (KSC '45) and Mrs. Robert M. Jarrett, Byron, Ill., on Nov. 6, 1948, a son, Robert Maxwell, Jr.

To Dr. (KSC '43) and Mrs. Richard E. Hineman, Dighton, Kan., on Nov. 16, 1948, a daughter, Teresa Diane.

Dr. (WASH '47) and Mrs. Donald L. Fox, Phoenix, Ariz., announce the birth of a daughter, Lynne Christine, on Nov. 20, 1948.

To Dr. (KSC '39) and Mrs. Peter J. Germanio, Maple Shade, N. J., on Nov. 22, 1948, a daughter, Susan Jean.

Dr. (OSU '47) and Mrs. Merrill Ranck, Prospect, Ohio, announce the birth of a daughter, Keena Marie, on Nov. 27, 1948.

Captain (OSU '44) and Mrs. Donald E. Guy, Ft. McPherson, Ga., announce the birth of twin sons, Donald Edward II and Dennis Alan, on Dec. 6, 1948.

Dr. (API '42) and Mrs. B. F. Cox, Raleigh, N. Car., announce the birth of their fourth son, Robert Leland, Dec. 14, 1948.

To Dr. (API '34) and Mrs. Alvin Roland Matthews, Jacksonville, Fla., a son, Chris Roland, on Dec. 22, 1948.

Dr. (KSC '47) and Mrs. Jacob Lawrence, Elmhurst, N. Y., announce the birth of Jonathan David on Dec. 31, 1948.

Dr. (PHIL '47) and Mrs. Herman Sher, Pittsburgh, Pa., announce the birth of Ronald Stuart's brother, Alan Kenneth, on Jan. 10, 1949.

Dr. (OSU '38) and Mrs. Fred B. Coates, Reidsville, N. Car., announce the birth of Fred B., Jr., on Jan. 10, 1949.

Dr. (UP '40) and Mrs. George J. Fleck, Lynchburg, Va., announce the birth of a son, George Jacob, on Jan. 12, 1949.

Dr. (UP '45) and Mrs. Robert A. Vanderhoof, Woodlake, Calif., announce the birth of their first child, John Robert, on Jan. 18, 1949.

To Dr. (ISC '46) and Mrs. A. J. Eckstein, New Ulm, Minn., a son, Bradley James, on Feb. 1, 1949.

Dr. (ISC '43) and Mrs. R. C. Brager, Clark, Ohio, announce the birth of a son, Jeffrey Rex, on Feb. 3, 1949.

To Drs. Oscar L., Jr. (UP '46) and Barbara S. (UP '45) Boyd, Waynesboro, Va., a son, William Linwood, on Feb. 7, 1949.

Lieut. Col. (CORN '32) and Mrs. Curtis W. Betzold, Seattle, Wash., announce the birth of their third child, Curtis William, Jr., on Feb. 12, 1949.

DEATHS

★**W. Reid Blair** (MC G '02), 74, New York, N. Y., director emeritus of the New York Zoological Park, died March 1, 1949, after a brief illness. An obituary will appear in the May JOURNAL. Dr. Blair was a member of the AVMA for forty-four years.

★**Thomas E. Booth** (AMER '06), 71, New York, N. Y., died on Feb. 20, 1949, after a lingering illness. Dr. Booth was a member of the New York State Veterinary Medical Association and of the AVMA for thirty years.

John E. Hampton (IND '17), 79, Portage, Pa., died on Jan. 16, 1949. Dr. Hampton gave up surgery a few years ago, but continued practicing until his death.

Dominik R. Herberich (CVC '20), Chicago, Ill., died on Jan. 21, 1949.

★**Harry W. C. Lichtenwalter** (OSU '08), 65, Sacramento, Calif., died of heart failure on Feb. 4, 1949. Upon graduation, Dr. Lichtenwalter entered the U. S. BAI at Chicago and was transferred to California in 1909. He resigned in 1913 to enter private practice in Sacramento where he later served as county livestock inspector. Dr. Lichtenwalter was a member of the California State Veterinary Medical Association and was admitted to the AVMA in 1910.

★**S. Frank Loffer** (KCVC '06), 70, San Marino, Calif., died of a heart attack on Feb. 12, 1949. A native of Maitland, Mo., Dr. Loffer had been a resident of California for thirty-five years. He was admitted to the AVMA in 1930.

F. Clifford Lull (ONT '07), Ellensburg, Wash., died on Dec. 5, 1948.

B. M. Miller, California, Mo., died Dec. 26, 1948. Dr. Miller had been a member of the AVMA.

F. C. Miller, Maquoketa, Iowa, died on Jan. 28, 1949.

★**Trelford S. Miller** (CORN '24), 59, New York, N. Y., died on Dec. 23, 1948. Dr. Miller was admitted to the AVMA in 1924.

R. P. Poage (KCVC '03), Shelbina, Mo., died late in 1948.

★**Hon. Alvin Sanders**, Wayne, Pa., died in July, 1948. A former publisher of the *Breeders Gazette*, Dr. Sanders was elected an honorary member of the AVMA in 1920. An obituary will appear in the May JOURNAL.

R. A. Scothorn (OSU '10), Spring Valley, Minn., died on Dec. 9, 1948.

James J. Sharp (IND '12), Vevay, Ind., died July 15, 1948.

Edward J. Sullivan (ONT '07), 67, Smithfield, R. I., died on Feb. 12, 1949. Dr. Sullivan was formerly senior meat inspector of the state Department of Public Health and was the oldest practicing veterinarian in the state until his retirement in September, 1948. He was a member of the Rhode Island Veterinary Medical Association and had been a member of the AVMA.

H. J. Van de Waa (ISC '09), Orange City, Iowa, died on Jan. 22, 1949.

★**John T. Waite** (MC K '11), 73, Fenton, Iowa, died on Jan. 1, 1949. Dr. Waite was admitted to the AVMA in 1924.

William T. White (HARV '97), Newtonville, Mass., died on Feb. 9, 1949. He became a member of the Massachusetts Veterinary Association in 1903 and an honorary member in 1939.

Arthur L. Wood (ISC '02), Hampton, Iowa, died no Jan. 7, 1949. Dr. Wood had been engaged in general practice.

O. E. York (CHI '13), Monticello, Iowa, died on Jan. 30, 1949.

★Indicates members of the AVMA.

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* *Keeney, E. L. and associates. Bull. Johns Hopkins Hospital 77:422, 1945*

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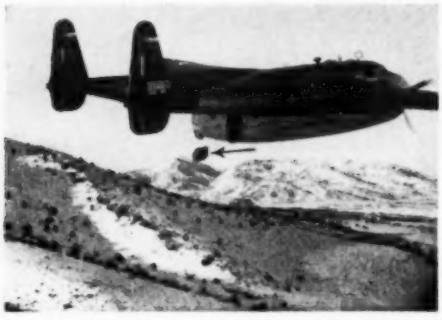
An' Related Topics

"Operation Feedlift"

The feeding, by the U. S. Air Corps, of vast herds of livestock doomed to die of starvation because of snow-blocked roads in January and February was a worthwhile piece of news in animal production.



—*Acme Photo*

Fig. 1—"Operation Feedlift's" first bale of hay dropped from a C-82 about 25 miles southeast of Ely, Nev., on January 24, brought feed to cattle threatened with starvation because of isolation in deep snow.

According to estimates of the Bureau of Agricultural Economics, USDA, the death losses in four states (North and South Dakota, Montana, and Wyoming) were 178,000 head—81,000 cattle and 97,000 sheep. These losses, and frozen animals in other western states, plus the weight losses, bring the poundage of food lost to sizeable figures. But the percentage was a small proportion of the total cattle and sheep in the regions affected, thanks to "Operation Feedlift."

—*Acme Photo*

Fig. 2—Shadow of C-82 passing over livestock on range near Ely, Nev., where feed was dropped to the starving herds. Precision bombing techniques, perfected during the last war, were used by the Air Force to drop the baled hay and cottonseed cakes.

COMING MEETINGS

Dairy and Food Inspectors' and Sanitarians' School. Annual meeting. Michigan State College, East Lansing, April 4-7, 1949. E. S. Churchill, dairy bacteriology laboratory, Michigan State College, East Lansing, Mich., chairman.

Animal Disease Research Workers in the Southern States. Annual meeting. Auburn, Ala., April 7-8, 1949. D. E. Howell, Oklahoma A. & M. College, Stillwater, Okla., secretary.

Northern Illinois Veterinary Medical Association. Spring meeting. Faust Hotel, Rockford, Ill., April 13, 1949. A. A. Legner, Sandwich, Ill., secretary.

Maine Veterinary Medical Association. Quarterly meeting. Bangor, Maine, April 13, 1949. S. W. Stiles, Falmouth Foreside, Maine, secretary.

Southeast Missouri Veterinary Medical Association. Spring meeting. Farmington, Mo., April 13, 1949. F. A. Stepp, 405 North St., Sikeston, Mo., secretary.

Iowa, North Central Veterinary Medical Association. Spring meeting. Wahkonsa Hotel, Fort Dodge, Iowa, April 21, 1949. B. J. Gray, Fort Dodge, Iowa, secretary.

American Animal Hospital Association. Annual meeting. Edgewater Beach Hotel, Chicago, Ill., May 5-7, 1949. Wayne H. Riser, Box 872, Evanston, Ill., secretary.

Society of American Bacteriologists. Annual meeting. Netherland Plaza Hotel, Cincinnati, Ohio, May 16-20, 1949. George R. Weber, Environmental Health Center, U. S. Public Health Service, Cincinnati 2, Ohio, chairman.

Missouri Veterinary Medical Association. Annual meeting. Hotel Jefferson, St. Louis, Mo., June 6-7, 1949. J. L. Wells, Box 676, Kansas City, Mo., secretary.

Oklahoma State Veterinary Medical Association, summer meeting, and Conference for Veterinarians. School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, June 6-7, 1949. Lewis H. Moe, School of Vet-

(*Continued on page 26*)

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(Continued from page 24)

erinary Medicine, Oklahoma A. & M. College, Stillwater, Okla.

Alabama Polytechnic Institute. Annual conference for veterinarians. Alabama Polytechnic Institute, Auburn, Ala., June 7-9, 1949. Dr. J. E. Greene, Cary Hall, A.P.I., Auburn, Ala., chairman.

Texas Veterinary Conference, A. & M. College of Texas. Annual conference. School of Veterinary Medicine, College Station, June 9-10, 1949. R. D. Turk, A. & M. College of Texas, College Station, Texas, chairman.

Georgia State Veterinary Medical Association. Annual meeting. Atlanta Biltmore Hotel, Atlanta, Ga., June 13-14, 1949. Chas. C. Rife, 420 Edgewood Ave., N.E., Atlanta, Ga., secretary.

Ohio State University, The. Annual conference for veterinarians. College of Veterinary Medicine, The Ohio State University, Columbus, June 15-17, 1949. R. E. Rebrassier, College of Veterinary Medicine, The Ohio State University, Columbus 10, Ohio, chairman.

New York State Veterinary Medical Society. Annual meeting. Pennsylvania Hotel, New York City, June 23-25, 1949. J. S. Halat, 1231 Gray Ave., Utica, N. Y., secretary.

Alberta Veterinary Medical Association. Annual meeting. Calgary, Alta., June 24-25, 1949. J. C. Wainright, Calgary, Alta., secretary.

North Carolina Veterinary Medical Association. Annual meeting. Carolina Beach, N. Car., June 28-29, 1949. J. H. Brown, Tarboro, N. Car., secretary.

Northwest Veterinary Medical Association (Oregon, Washington, and British Columbia). Annual meeting. Empress Hotel, Victoria, British Columbia, on June 28-30, 1949. F. W. B. Smith, 602 Credit Foncier Bldg., Vancouver, B. C.

American Veterinary Medical Association. Annual convention. Book-Cadillac and Statler Hotels, Detroit, Mich., July 11-14, 1949. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Kentucky State Veterinary Medical Association. Annual meeting. Louisville, Ky., Aug. 17-18, 1949. Ross Brown, Lexington, Ky., secretary.

Colorado State Veterinary Medical Association. Annual meeting. Shirley Savoy Hotel, Denver, Colo., Sept. 29-30, 1949. W. P. Blake, 2410 8th Ave., Greeley, Colo., secretary.

Chief Livestock Sanitary Officials. National Assembly. The Neil House, Columbus, Ohio, Oct. 10-11, 1949. Dr. C. F. Clark, State Office Building, Lansing 13, Mich., secretary.

United States Livestock Sanitary Association. Annual meeting. The Neil House, Columbus, Ohio, Oct. 12-14, 1949. Dr. R. A. Hendershott, 1 West State St., Trenton 8, N. J., secretary.

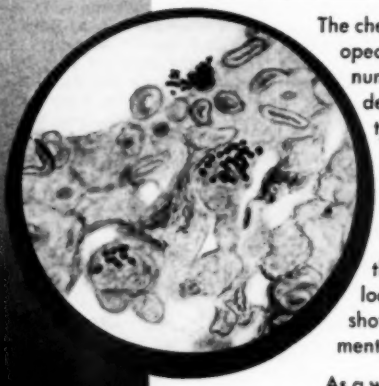
Iowa, Eastern Veterinary Medical Society. Annual meeting. Hotel Montrose, Cedar Rapids, Oct. 20-21, 1949. Laurance P. Scott, P. O. Box 325, Waterloo, Iowa, secretary.

Southern Veterinary Medical Association. Annual meeting. Thomas Jefferson Hotel, Bir-

(Continued on page 28)

Chemotherapy of
STAPHYLOCOCCUS INFECTIONS
in Animals

HIGHLY EFFECTIVE ORALLY AND LOCALLY



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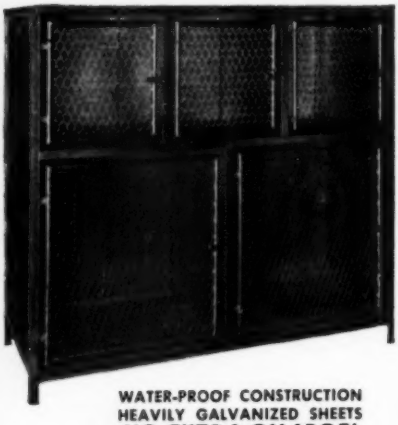

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(Continued from page 26)

mingham, Ala., Nov. 7-9, 1949. A. A. Husman, 320 Agricultural Bldg., Raleigh, N. Car., secretary.

• • •

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. George E. Martin, 530 Stockton Ave., San José, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Thomas Eville, Route 1, Box 136H, Fresno, Calif., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. O. A. Soave, 5666 Telegraph, Oakland, Calif., secretary.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association, Houston, Tex., the first Thursday of each month. Edward Lepon, Houston, Tex., secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Wednesday of even-numbered months. R. A. Case, 400 S. Garden St., Peoria, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, the third Tuesday of each month. J. J. Arnold, Box 144, New Castle, Ind.

Jefferson County Veterinary Society, Louisville, Ky., the first Wednesday evening of each month. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

Michiana Veterinary Medical Association, Hotel Elkhart, Elkhart, Ind, the second Thursday of each month, at 7 p. m. R. W. Worley, 3224 Lincoln Way West, South Bend, Ind., secretary.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroe-

(Continued on page 30)

Better way to give Penicillin in MASTITIS

Stults and Foley[1] have reported that single injections of penicillin-in-PENICLE* have proved highly successful in the treatment of mastitis caused by penicillin-sensitive organisms.

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persistent therapeutic levels

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1. Stults, A. W., and Foley, E. J.: J. Am. Vet. M. A. 113: 68 (July) 1948.

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(*Continued from page 28*)

der, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. I. N. Bohlender, Box 588, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. James R. Ketchersid, 666 East Highland Avenue, San Bernardino, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. E. W. Paul, Box 866, Redwood City, Calif., secretary.

Redwood Empire Veterinary Medical Association, the second Tuesday of every other month. Charles D. Stafford, Novato, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the fourth Friday of each month. R. C. Goulding, 11511 Capitol Avenue, Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the third Tuesday of each month. Mitchell Smith, 3740 Rosecrans Boulevard, San Diego, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. H. I. Ott, 10326 East Artesia Blvd., Bellflower, Calif., secretary.

• • •

Foreign Congresses

Seventh Pacific Science Congress. New Zealand, Feb. 2-22, 1949. Mr. Harold J. Coolidge, 2101 Constitution Ave., Washington 25, D. C., executive secretary.

Fifth International Congress of Comparative Pathology. Istanbul, Turkey, May 17-20, 1949. Dr. Louis Grollet, 7 rue Gustave Naduad, Paris 16 e, France, general secretary of permanent committee.

National Veterinary Medical Association of Great Britain and Ireland. London, England, Aug. 12-15, 1949. F. Knight, General secretary, 36, Gordon Square, London, W.C.1.

Fourteenth International Veterinary Congress. London, England, Aug. 8-13, 1949.
General Secretary, Permanent Committee: Prof. L. de Blieck, Kwartellaan 51, The Hague, Netherlands.
General Secretary, Organizing Committee: Mr. W. G. R. Oates, 9 Red Lion Square, London, W. C. 1, England
Secretary, United States Committee: J. G. Hardenbergh, 600 S. Michigan Ave. Chicago 5, Ill. (Applications for membership from veterinarians in the United States may be obtained by writing to Dr. Hardenbergh.)

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We may come to the point where ⅞ of the people will seek to live off the exertions of the other ⅛.—*Abraham Lincoln.*

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June, 1949 graduate wants assistantship in mixed dairy practice. Several summers' work with practitioners, married, own automobile. References and interview upon request. Will go anywhere. Please state particulars. Address "Box F 11," c/o Journal of the AVMA.

Completing internship at Angell Memorial Animal Hospital, Boston, Massachusetts, in May. Licensed in Massachusetts and Michigan. Interested in a position in small animal hospital. Address Dr. A. A. Barry, Massachusetts Society for the Prevention of Cruelty to Animals, 180 Longwood Ave., Boston 15, Mass.

Graduate veterinarian with eight years' experience, now attending medical school, desires position for summer months. Single; will travel. Address "Box F 18," c/o Journal of the AVMA.

Wanted—Practices

WANTED TO BUY—Small animal practice in Chicago or surrounding zone. Modern hospital facilities preferred. Give full particulars and financial arrangement first letter. Address "Box F 14," c/o Journal of the AVMA.

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Desire to purchase part or all of mixed practice in Midwest, or obtain working interest with older veterinarian. Excellent references, ten years' experience with farmers. Address "Box F 1," c/o Journal of the AVMA.

Graduate, experienced veterinarian wants to lease or buy active small animal or mixed practice in any state. Would prefer practice in Pennsylvania, New Jersey, Maryland, or Delaware. Give full details. Can settle suitable practice at once. Address Dr. Martin A. Bree, 7348 Frankford Avenue, Philadelphia 36, Pa.

Experienced Cornell graduate desires to purchase mixed practice in New York or New Jersey. Will consider partnership or share basis. Prefer to be near large city. Address "Box F 19," c/o Journal of the AVMA.

Established dairy and small animal practice wanted in desirable community of over 10,000 population in eastern United States. Please give

(Continued on page 34)

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Start creep feeding at 2 weeks. Oats should be pulverized. Legume hay should be fed, free choice, when pigs are in dry lot.

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Veterinary Division

(Continued from page 32)

all details in first letter. Address "Box F 13," c/o Journal of the AVMA.

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Graduate veterinarian with bureau experience in meat processing and abattoir inspection wanted. Starting salary $300 per month, two weeks' vacation, sick leave, and pension with retirement benefits. Give age, experience, references, and other particulars when answering. Permanent position. Address "Box F 3," c/o Journal of the AVMA.

Veterinarian wanted for staff of small animal hospital; also opportunity to have some large animal practice. State age, weight, religion, nationality, and marital status. Include snapshot and references. Address Dr. R. A. Self, 800 N. Oak Cliff Blvd., Dallas, Texas.

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FOR SALE—Mixed practice, excellent location on main highway in central Connecticut. Includes modern, completely equipped hospital. Address "Box F 7," c/o Journal of the AVMA.

FOR SALE—Mixed practice in southeastern Wisconsin. Country practice, largely dairy cattle. Property consists of small animal hospital, 5-room, modern brick home. Established twenty-two years in city of 50,000 population. Address "Box F 17," c/o Journal of the AVMA.

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(Continued on page 38)

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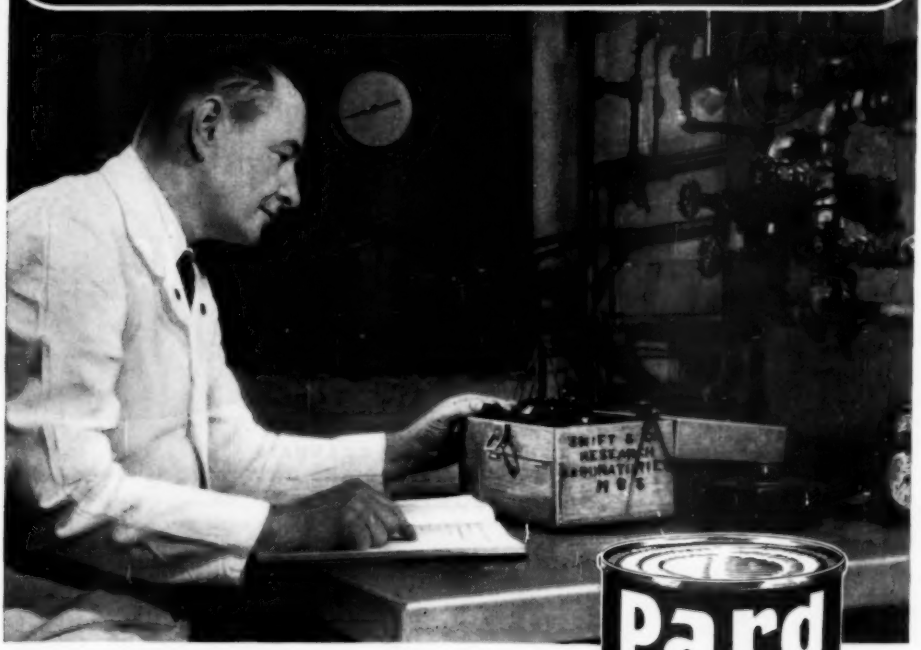

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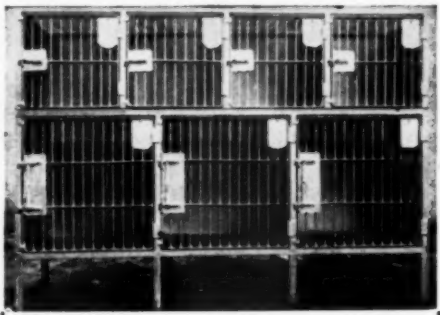

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1. Vet. Med. *42*:170, May 1947 2. N. Am. Vet. *27*:564, Sept. 1946; J. Am. Vet. M. A. *107*:338, Oct. 1945; J. Am. Vet. M. A. *106*:7, Jan. 1945

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(Continued from page 34)

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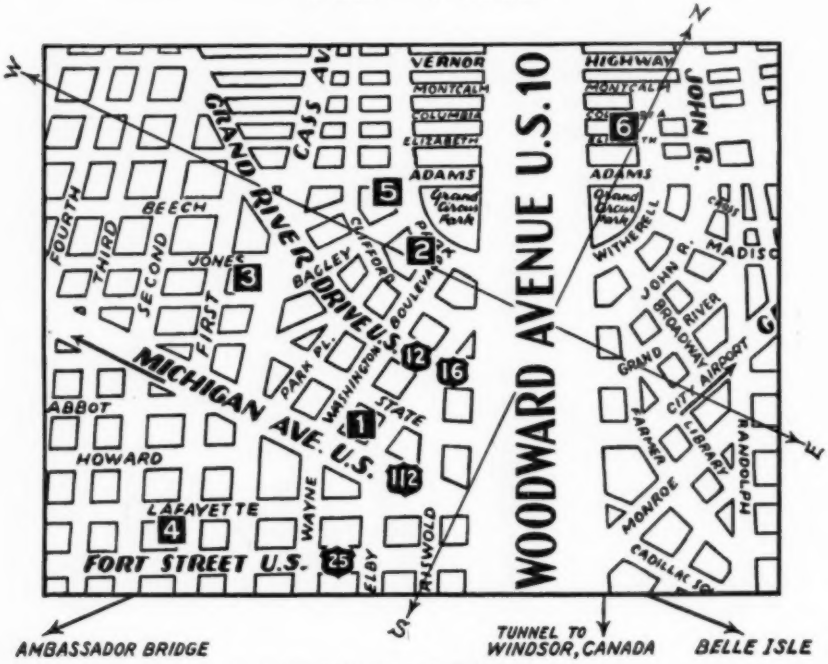

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July 11-14, 1949

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Be sure to indicate your first, second, and third choice hotel. *Date and time of arrival must be given, also date of expected departure.*

Address your request to the hotel of first choice; if this hotel cannot accommodate you, it will be referred to the Detroit Convention and Tourist Bureau which will then pass it on to the hotel of your next choice. You will receive a confirmation of your reservation directly from the hotel.

The Book Cadillac and Statler Hotels will serve as Joint Headquarters and each has allotted a good number of rooms for the AVMA Convention. However, these two hotels will not be able to meet all requests and, therefore, four other near-by hotels have been listed, giving a good range of accommodations and rates. All are first-class, and the locations of them are shown on the map on the opposite page.

The number of single rooms is limited and double occupancy is urged for as many as possible.

Schedule of Hotel Rates—See Locations on Opposite Page

Hotel	Single	Double Bed	Twin Beds	Suites
Book-Cadillac (Headquarters Hotel) 1114 Washington Blvd.	$3.50 up	$7.00 up	$7.00 up	$15.00-$32.00
Statler (Headquarters Hotel) 1539 Washington Blvd.	$3.50 up	$6.50 up	$7.50 up	$13.50-$25.00
Detroit Leland 1701 Cass St.	$3.75 up	$6.25 up	$7.00 up	*
Fort Shelby 525 W. Lafayette St.	$3.50 up	$6.00 up	$6.50 up	*
Tuller 521 Park Ave.	$2.75 up	$5.00 up	$6.00 up	*
Wolverine 50 E. Elizabeth St.	$2.75 up	$5.00 up	$7.00 up	*

*Inquire direct to hotel for rate and availability of suites.

---------- Cut Off Here ----------

HOTEL RESERVATION FORM—AVMA CONVENTION

(Please type or print)

To: Hotel (name)..... Date .....

Address .....

Detroit, Mich.

Please make reservations noted below:

First choice Hotel.....

Second choice Hotel.....

Third choice Hotel.....

Accommodations and Rate Desired

Single Room .....Rate.....

Double Room .....Rate.....

Twin Bed Room.....Rate.....

Parlor Suite .....Rate.....

Two Bedroom Suite.....Rate.....

Other (specify) .....Rate.....

Arriving on (date).....at .....a.m.....p.m.

Leaving on (date).....at .....a.m.....p.m.

Room will be occupied by:

Name .....Address .....

Name .....Address .....

Name .....Address .....

Name .....Address .....

I understand that, if the hotel of first choice to which this request is addressed cannot furnish the accommodations desired, it will be referred promptly to the Detroit Convention Bureau for attention.

Signed .....

Street Address .....

City .....Zone .....State .....

C.G.P. Reinforced

U. S. Patent No. 2183268

contains

—in addition to Calcium—

Phosphorus, Magnesium,

and 25% Dextrose

. . . for the simultaneous intravenous administration of medicinal amounts of these four important ingredients that may be deficient in conditions of disturbed metabolism, caused by unbalanced mineral and carbohydrate ratios in soil, food, or body.

C. G. P. Reinforced proves the most dependable preparation for treating the complicated cases as well as simple forms of neurosis.

It is free of body-foreign stabilizers and will not precipitate under extreme temperature or long storage.

Supplied in 500 cc. puncture-sealed bottles:

Ctn. 6 bottles, $4.30; Ctn. 12 bottles, $8.40.

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C·B·G

Use C.B.G.—a 25.7% solution of calcium borogluconate—in the treatment of uncomplicated, parturient paresis (milk fever) of cows and in the clinical syndromes of all domestic animals where hypocalcemia is a primary or contributing factor. C.B.G. assures maximum, systemic utilization of readily ionized organic calcium.

Box of 12, 250 cc.....$6.00 Box of 12, 500 c.c.....$8.00

(For gross of either size, deduct 10%)

D·C·M

Use D.C.M. — containing 3.7 ounces calcium borogluconate with .66 ounces of magnesium borogluconate and 2.75 ounces of C.P. dextrose — in either primary or complicated hypocalcemic syndromes as milk fever, grass tetany, eclampsia, rachitic tetany, etc. D.C.M. is the product of choice where coexistent magnesium deficiency is a factor.

Box of 12, 500 cc.....$8.40

(For gross of 500 cc.—deduct 10%)

SOLD TO VETERINARIANS ONLY

★ C.B.G. and D.C.M., like all Jen-Sal products, are available to the veterinary profession only. Both contain organic calcium as the borogluconate salt produced under Jen-Sal Patent No. 2,007,786.

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